This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

Soc. 18949 d. $\frac{184}{5}$

TRANSACTIONS

OF THE

AMERICAN

ENTOMOLOGICAL SOCIETY.

VOL. V.

PHILADELPHIA.
PRINTED BY THE SOCIETY.
1874—1876.

BIBLIOTHECA·BODLEIANA·

LIST OF PAPERS.

Cresson, E. T.

PAGE
Descriptions of new Hymenoptera. - - - - - 99
Descriptions of new species of Mutilla. - - - 119

Crotch, G. R.

Descriptions of new species of Coleoptera from the Pacific Coast of the United States. - - - - - - 73

Edwards, Wm. H.

Descriptions of new species of Diurnal Lepidoptera found in North America. - - - - - - 13, 103
Description of a new species of Catocala from Arizona. 112
Descriptions of new species of Diurnal Lepidoptera found within the United States and British North America. 202
New species of Diurnal Lepidoptera. - - - 289

Grote, Aug. R.

Remarks on North American Noctuidæ with descriptions of new species. - - - - - - - - - 89
Descriptions of North American Moths. - - - 113
Note on Papilio Gundlachianus. - - - - - 118

Horn, Geo. H.

Revision of the species of Trox of the United States. - 1
Descriptions of new species of United States Coleoptera. 20
Notes on the species of Rhipiphorus of the United States. 121
Synonymical Notes and Descriptions of new species of North American Coleoptera. - - - - - - 126
Revision of the United States species of Ochodæus and other genera of Scarabæidæ. - - - - - - 177

HORN, GEO. H. PAGE
Notes on the Coleopterous fauna of Guadalupe Island. 198
Description of a new species of Dacoderus from the Island of Santo Domingo. - - - - - - - - 219
Synopsis of the species of Cymatodera and Trichodes of the United States. - - - - - - - - 220
The sexual characters of North American Cicindelidæ with notes on some groups of Cicindela. - - - 232
Notes on some Coleopterous Remains from the bone cave of Port Kennedy, Pennsylvania. - - - - - 241
Synoptic tables of some genera of Coleoptera, with notes and synonymy. - - - - - - - - - 246
Revision of the species of Chlænius of the United States. 253

LECONTE, JOHN L.
Descriptions of new Coleoptera chiefly from the Pacific slope of North America. - - - - - - 43
Notes on the genus Pleocoma, Lec. - - - - - 81
On the Cupesidæ of North America. - - - 87
Notes on the Cicindelidæ of the United States. - - 157
Notes on the Rhysodidæ of the United States. - - 162
Descriptions of new Coleoptera of the United States, with Notes on Geographical Distribution. - - - 169
On the Affinities of Hypocephalus. - - - - - 209

McCOOK, HENRY C.
Notes on the architecture and habits of Formica Pennsylvanica, the Pennsylvania Carpenter Ant. - - 277

OSTEN SACKEN, R.
Description of the Larva of Pleocoma, Lec. - - 84

BIBLIOTH. BODLEIANA

TRANSACTIONS

OF THE

AMERICAN ENTOMOLOGICAL SOCIETY.

VOLUME V.

Revision of the Species of TROX of the United States.

BY GEO. H. HORN, M. D.

In the ninth and tenth parts of the *Coleopterologische Hefte* (Munich, 1872), Harold has published an elaborate monograph of the species of Trox, in which ninety-three species are fully described from the entire globe, fifteen remain unknown to him, of which seven belong to our fauna. With the view of endeavoring to supply the deficiency, as far as our species are concerned, as well as of making known to American students the results of Harold's studies, the following brief memoir has been prepared.

Our species may be separated into two groups, characterized as follows:

Scutellum hastate, that is, narrowed strongly near the base, the sides at middle angulate; sides of thorax never setose..............................Group I.
Scutellum oval, never hastate; sides of thorax in many species setose...Group II.

Group I.

The first group contains all the larger forms and may be divided into *winged* and *apterous* species. The latter have the elytra of oval form, the humeri broadly rounded and no humeral umbone; the metasternum is always very short and the rhomboidal space at its middle much broader than long. The winged species have oblong elytra, the humeri more abrupt and the umbone always distinct; the mesosternum is normal in form and the rhomboidal space at middle at least as long as wide.

The following table gives the other characters:

Elytra oval, body apterous, no humeral umbone...................**scutellaris.**
Elytra oblong, body winged, humeral umbone distinct..............................**1.**
1. Elytra with rows of tubercles very distinct and tomentose........................ **2.**
Elytra with rows of tubercles much less distinct, never tomentose... ....**3.**

2. First joint of antennæ with dark brown hairs; club dark........**scabrosus.**
First joint with rufous hairs; club rufous or cinereous..............................4.
4. Elytral tubercles round, their entire surface tomentose ....**monachus.**
Elytral tubercles oblong, the anterior portion of each glabrous.........**asper.**
3. Sides of thorax near the hind angles rather deeply incised; elytra not distinctly tuberculate..**suberosus.**
Sides of thorax not or very feebly incised; elytra with well marked rows of glabrous tubercles. ....**punctatus.**

These species have a facies totally different from those of the next group arising principally from the form of the thorax as well as its sculpture. The base of the thorax here is always subpedunculate and consequently near the sides is always distant from the base of the elytra, the hind angles are always obtuse and the margin in front of them either with a well marked incisure or a feeble sinuation. These characters are entirely absent in the next group and even in those species in which the base of the thorax is deeply sinuous on each side (*Sonoræ*, *tuberculatus*, etc.). there is no space between the base of thorax and elytra, when in the normal position.

T. scutellaris, Say, Journ. Acad., 1823, p. 238; Lec. Proc. Acad., 1854, p. 214; Coleop. Kansas, pl. 1, fig. 4; *texanus*, Lec.; *suturalis*, Lec.; *umbonatus*, Lec. loc. cit., p. 214; Harold, Col. Hefte, ix., x. p. 56.

By the characters already mentioned this species may be readily known. The three synonyms above cited all indicate well marked varieties which appear to lead insensibly from one to the other.

Var. *texanus*, Lec.—The largest form. Elytra broadly oval and with rows of tubercles closely placed longitudinally, but with moderately well marked intervals between the rows. Sides of thorax near the base with a slight sinuation.

Var. *scutellaris*, Say.—Elytra rather less broadly oval. Tubercles more distinct, flatter, not confluent longitudinally but with well marked intervals between them and without any intervals between the rows. Sides of thorax entire.

Var. *suturalis*. Lec.—Tubercles more convex and exhibiting a tendency in the rows to alternate with larger and smaller tubercles, which are, however, closely placed longitudinally and laterally. Sides of thorax entire.

Var. *umbonatus*, Lec.—Elytra distinctly more oblong. Rows of tubercles decidedly alternating, the tubercles rather closely placed but of irregular polygonal form. Sides of thorax entire. The thoracic sculpture consists of four oval tubercles usually smooth and shining, placed along the basal margin, the central pair somewhat larger; in front of the outer basal tubercle is another of smaller size and less regularly oval; in front of the median pair of tubercles an irregular figure resembling the letter "k," the vertical line being toward the middle and the bottom of the letter toward the front. This latter figure varies somewhat, but the sculpture as above described is that which is characteristic of the entire group. The space between these elevated portions is opaque and clothed with a cinereous or luteous indument, as is also the space between the elytral tubercles.

With the known variation of *punctatus* and *suberosus*, as shown by the large series before me, I cannot see that any of the above mentioned forms are entitled to rank as species.

Varies greatly in size. Length .60—.80 inch; 15—20 mm.

Occurs in Texas, New Mexico, Kansas and also in Mexico.

T. scabrosus, Beauv. Ins. p. 175, pl. 4b, fig. 4; Lec. Proc. Acad., 1854, p. 215; Harold, loc. cit. p. 100.

The surface of this species is almost always concealed by a brownish opaque coating. The thoracic sculpture is a modification of that described in *scutellaris*, having the basal tubercles more elongate and coated as the remainder of the surface; the "k"-shaped figure is also less distinctly marked. The sides of thorax are rather irregular and near the base deeply notched, the hind angle being in the form of a rounded lobe. The base of thorax is rather acutely lobed at middle. The elytra are oblong in form and with moderately elevated oblong tubercles having a tomentose summit. Between the rows of larger tubercles is a secondary series of smaller size and less elevation, also tomentose at top and on each side of these secondary tubercles a row of rounded granular elevations, while the surface between all these elevations is nearly smooth. The basal joint of the antennæ, the labrum and mandibles are clothed with stiff brown hair and the club of the antennæ is of sooty color.

The presence of the triple series of tubercles in this species affords an easier method of distinguishing it from the two following than the color of the hairs of the basal joint of the antennæ. The median tooth of the anterior tibiæ is also more distinct. Length .60—.70 inch; 15—18 mm.

This species occurs in nearly the entire region east of the Mississippi river and south of the lakes, but is much more abundant in the Gulf States.

T. monachus, Herbst, Käfer, iii. p. 25, pl. 21, fig. 7; Harold, loc. cit. p. 116; *tuberculatus* || Beauv. Ins. p. 175, pl. 4b, fig. 3; *pustulatus*, Lec. Proc. Acad. 1854, p. 215.

More oblong and of less robust facies than the preceding species The thoracic sculpture is similar and the entire surface of body similarly invested. The notch near the hind angles is nearly as deep as in *scabrosus*, but the angular lobe less prominent, while the sinuation of the base immediately within the angle is much more pronounced. The elytral sculpture consists primarily of five series of tubercles (of which the sutural is smaller) of more or less oval form rather distantly placed and in each row alternating with the next, and at their summits tomentose. The spaces between the tubercles are finely but sparsely granulate. At the apical fourth of the elytra one of the tubercles of the third series is much larger, and on the fourth and fifth series a similarly enlarged tubercle but of less size than that of the third. This character is scarcely evident in *scabrosus* and much less distinct in *asper* than in the present species.

The hairs of the basal joint are very pale brown, and the antennal club rufous. Length .50—.64 inch.; 13—16 mm.

In very well preserved specimens it will be noticed that certain individuals have the spur of the anterior tibiæ straight, and others very distinctly arcuate near the tip. This appears to me to afford the means of distinguishing the sexes, the former being females and the latter males; as the spurs are almost always more or less worn the character becomes as useless for the determination of the sexes as is the knowledge acquired by its presence.

Occurs in the Southern States and also west of the Mississippi from Kansas to Texas.

T. asper, Lec. Proc. Acad. 1854, p. 215; Harold, loc. cit. p. 118.

The notch at the side of the thorax is less deep than in the preceding two, the angular lobe less prominent and the sinuation within it less marked than in *monachus*. The elytral tubercles are here elongate and closer together, and their summits tomentose except a glabrous space at the anterior portion of each. In the interval between the rows of large tubercles may be seen a row of small tubercles, on each side of which is a row of moderately deeply impressed punctures. The antennæ are similar to those of *monachus*, but the club is somewhat darker.

This species is somewhat smaller than the preceding, being rarely longer than .50 inch; 13—14 mm.

Occurs with the preceding.

The following species have the tubercles much less elevated, of oval or rounded form and never tomentose at tip, but smooth and shining. The sculpture of both species is extremely variable, and has caused them to be unnecessarily divided.

T. suberosus, Fab. Syst. Ent. p. 31; Harold, loc. cit. p. 119; *crenatus*, Oliv. Ent. 1, 4, p. 7, pl. 1. fig. 4; Beauv. Ins. p. 176, pl. 4b, fig. 6; *denticulatus* ‡ Beauv. loc. cit. fig. 7, 8; *alternatus*, Say, Bost. Journ. 1, p. 179; *punctatus* ‡ Lec. Journ. Acad. 1854, p. 215.

This is the species so long known in our cabinets under the latter name.

The thoracic sculpture is similar to that of *monachus*, but the tubercles are much less elevated and less distinctly marked. The sides of thorax are rounded and the emargination in front of the hind angles broad and not nearly as deep as in *monachus*, etc. The elytral tubercles, even in the best marked specimens, are of but slight elevation, and between them are slight tomentose patches. The intervals are biseriately punctured. There is scarcely any trace of subapical umbone. Length .40—.66 inch; 10—17 mm.

Varieties occur with scarcely any elytral tubercles, the only sculpture remaining being the punctures, and in which the surface coating is entirely absent so that the specimens are black and shining.

I have specimens before me from every section of our country excepting California and the region to the north. It occurs in the Peninsula of Lower California and thence southward to Patagonia.

T. punctatus, Germ. Ins. Spec. Nov. p. 113; Harold, loc. cit. p. 124; *morsus*, Lec. Proc. Acad. 1854, p. 216; var. *integer*, Lec., var. *tesselatus*, Lec. loc. cit.

The thoracic sculpture is much more distinctly marked than in any of the forms of the preceding species, and in fact approaches more nearly that of *scutellaris*, not only in form but also in the glabrous summits of the tubercles. The elytral tubercles are oval, moderately elevated, with tomentose space between them, and placed at a distance from each other greater than the size of the tubercles. The sculpture is of course somewhat variable and several varieties may be noted.

Var. *integer*, Lec.—Sides of thorax with scarcely any evidence of the notch near the hind angles. Elytral tubercles forming five principal series, between which are smaller tubercles not very evident, and the intervals slightly wrinkled.

Var. *morsus*, Lec.—Sides of thorax posteriorly feebly notched. Elytral sculpture similar to that of *integer*.

Var. *tesselatus*, Lec.—This is the larger form, and its general aspect resembles *scutellaris*. The sides of the thorax have a mere trace of notch. The tubercles of the elytra are moderately elevated, smooth and shining and those of the secondary series are nearly as conspicuous as those of the primary.

As in *suberosus* the sub-apical umbone is reduced to a minimum.

The length varies from .48—.66 inch; 12—17 mm.

Occurs in the southern Atlantic and Gulf States, Kansas, New Mexico, Arizona, Peninsula California, California and Mexico.

GROUP II.

The species of this group are all smaller than those of the preceding, and some of them are even below the medium size. The variations of the thoracic sculpture will be noted in the remarks on the several species.

The tip of the prosternum behind the coxæ varies in form, and has been made use of by Harold with success in his synoptic table. The tip may be spiniform, sub-cariniform or entirely flat. The hind femora may have their upper posterior margin either spinulose or simple, and in accordance with the presence or absence of these characters the main subdivisions of the table are formed.

Prosternum at tip spiniform; hind femora spinulose............ **14.**
Prosternum not spiniform, sometimes subcariniform or slightly prominent............ **1.**
1. Hind femora spinulose along the posterior margin............ **2.**
Hind femora not spinulose............ **3.**
2. Thorax with median sulcus limited on each side by an obtuse ridge............ **4.**
Thorax not sulcate; elytra not tuberculate............ **15.**
4. Elytral tubercles with erect setæ; median sulcus usually entire. **tuberculatus.**
Elytral tubercles squammulato-pilose; median sulcus usually interrupted............ **5.**
5. Elytral margin strongly serrulate; tubercles cristiform, those of the second and third rows continuous at basal half............ **gemmulatus.**
Elytral margin feebly serrulate; tubercles feebly elevated, usually nearly flat at the posterior declivity............ **Sonoræ.**
3. Elytral tubercles with black setæ............ **6.**
Elytral tubercles with rufous or pale hairs or scales............ **7.**
6. Tubercles elevated, setæ erect, moderately long............ **erinaceus.**
Tubercles scarcely evident, setæ very short............ **capillaris.**
7. Elytra with rows of tubercles or with patches of scales or setæ replacing them............ **8.**
Elytra without tubercles, surface with coarsely punctured striæ............ **16.**
8. Elytra distinctly tuberculate; thorax with well marked ridges............ **9.**
Elytra not tuberculate, the tubercles replaced by patches of setæ............ **10.**
9. Thorax sulcate at middle, the median ridges straight............ **11.**
Thorax bifoveate, the ridges very sinuous............ **12.**
11. Elytral margin at base entire............ **unistriatus.**

Elytral margin at base crenulate or serrulate........................ ..**sordidus.**
12. Tubercles of elytra with erect brownish setæ........................**foveicollis.**
Tubercles squammulose, scales pale rufous...........................**terrestris.**
10. Anterior tibiæ above the lateral tooth simple..........................**æqualis.**
Anterior tibiæ above the lateral tooth serrulate....................................**13.**
13. Elytral intervals equal; pubescent spots small, round and distant; hind tarsi short, joints 2, 3, 4 not longer than wide..........................**fascifer.**
Elytral intervals slightly alternating, pubescent spots longer; hind tarsi with joints 2, 3, 4 distinctly longer than wide...........................**scaber.**
14. Elytral intervals with a single row of short erect setæ; anterior tibiæ bidentate externally and crenulate near the base..........................**atrox.**
15. Elytra black, shining, intervals flat with very slight elevations, each bearing a single short seta; hind tarsi slender...... ....**laticollis.**
16. Elytra black, shining, intervals moderately convex, very sparsely punctulate and with sparsely placed, extremely short setæ; striæ coarsely punctured; anterior tibiæ feebly bidentate externally; hind tarsi rather short............... ....**striatus.**

The above table is considerably changed from that of Harold, although based on it. The first change that will be noticed is in the position of *erinaceus*. I have associated it with *capillaris* from the entirely dark, nearly black, scale-like hairs which tip the tubercles. All the following species have the hairs so much lighter in color that contrast in the table is better preserved by the change.

In order to avoid the use of characters drawn from the length of the hind tarsus as compared with the middle tibia, I have used the thoracic sculpture as a basis, and from it arrange the species in such sequence as appears the most natural from their general aspect. The gradual obliteration of thoracic, and change of elytral sculpture are thus shown. Of the last five species four were unknown to Harold.

T. tuberculatus, Degeer, Mém. Ins. iv., p. 318, pl. 19, fig. 2; Oliv. Ent 1, 4, p. 9, pl. 2, fig. 8; Hbst. Käf. iii., p. 23, pl. 21, fig. 6; Lec. Proc. Acad· 1854, p. 212; Harold, loc. cit. p. 155; *serrulatus*, Beauv. Ins. p. 176, pl. 4b, fig 9; *canaliculatus*, Say, Long's Exped. App. ii., p. 278.

Form oblong. Clypeus rotundato-angulate. Head punctured, vested with four small tufts of hair sometimes forming a transverse continuous line. Antennæ rufous. Thorax narrower in front, sides moderately arcuate, base on each side moderately sinuate; median sulcus limited by an entire ridge on each side, rarely interrupted at middle by a transverse elevation. Elytra with rows of moderately distinct, feebly elevated, tubercles with brownish suberect scale-like hairs; intervals with much smaller tubercles. Prosternal process elevated in an obtuse ridge. Anterior tibiæ with one small marginal tooth and above it subserrate. Posterior femora spinulose along the hind margin. Length .36—.40 inch; 9—10 mm.

Occurs from Pennsylvania to Arizona and Kansas.

T. gemmulatus, n. sp.

Oblong, moderately robust. Clypeus obtusely rounded, head coarsely punctured. Antennæ dark brown, club fuliginous. Thorax more than twice as wide as long, sides moderately arcuate, disc longitudinally sulcate, sulcus interrupted at middle. Sutural row of tubercles small, the others strongly elevated, each tubercle elongate, those of the second and third rows forming a continuous ridge at basal third, at summits with short, pale rufous scales. Elytral margin serrate in in its entire extent. Prosternal process in form of an elongate tubercle. Hind femora spinulose posteriorly. Anterior tibiæ serrate at base, unidentate below the middle of the outer margin. Length .40—.44 inch; 10—11 mm.

The facies of this species is such that it never would be confounded either with *tuberculatus* or *Sonoræ*, being more robust, with broader thorax and and with its tubercles strongly elevated, much more so, in fact, than in any species in our fauna.

Specimens have been sent me by Mr. H. Edwards, of San Francisco, collected at San Diego. This species has been long known to us under the above name in the cabinet of Dr. Leconte.

I cannot find that it has been described, and I retain the name under which we have known it to avoid confusion.

T. Sonoræ, Lec. Proc. Acad. 1854, p. 211; *alternans* || Lec. loc. cit. p. 212; *Lecontei*, Harold, loc. cit. p. 156.

This species closely resembles *tuberculatus*, and differs in having the elytral tubercles less elevated and covered with short, pale rufous scales. The intervals have smaller tubercles, less evident at middle and also a double row of punctures, and near each puncture two small granules. Elytral margin finely serrate. Prosternum, anterior tibiæ and posterior femora as in *tuberculatus*. Length .32—.40 inch; 8—10 mm.

I cannot find that *T. Sonoræ* differs at all from that which we have known as *alternans*, and therefore drop the latter name (being preoccupied) and also that which Harold has given in its stead.

Occurs in Kansas, Texas and Arizona and the adjoining regions of Mexico.

T. erinaceus, Lec. Proc. Acad. 1854, p. 212; Harold, loc. cit. p. 180.

This species resembles *tuberculatus* very closely but is rather more robust in form. The clypeus is more distinctly angulate at middle and the front with two setigerous spots. The median sulcus is feebly interrupted. The elytral tubercles are feebly elevated but clothed at summits with erect black setæ, the intervals have smaller tubercles scarcely evident at the disc and small granules irregularly disposed. The prosternal process is slightly impressed at middle. The hind femora are mutic. Anterior tibiæ finely crenulate at base and with a small tooth slightly below the middle. Length .25—.28 inch; 6—7 mm.

Occurs in New Jersey, Illinois, Georgia, Indian Territory.

T. capillaris, Say, Journ. Acad. 1813, p. 238; Harris, Trans. Hartf. Soc. 1837, p. 77; Lec. Proc. Acad. 1854, p. 212; Harold, loc. cit. p. 170.

Oblong oval. Clypeus broadly arcuate. Sides of thorax feebly arcuate, gradually wider to base, median sulcus feeble but entire. Elytral tubercles feebly elevated, at summits tomentose with black, tubercles distant and small, intervals with smaller tubercles, scarcely evident at the sides, suture slightly elevated. Prosternum at tip slightly elevated. Anterior tibiæ unidentate externally and very feebly serrate. Length .36—.44 inch; 9—10 mm.

Occurs from Canada to Texas and Kansas.

T. unistriatus, Beauv. Ins. p. 175, pl. 4b, fig. 5; *porcatus*, Say, Journ. Acad. 1825, p. 193; Lec. Proc. Acad. 1854, p. 212; Harold, loc. cit. p. 173.

Elongate ovate. Clypeus rounded. Thorax transversely quadrate, sides feebly arcuate, hind angles rectangular, median sulcus feeble, entire. Lateral margin of elytra entire, tubercles very feebly elevated, elongate and biseriately squammulato-pilose, intervals with very small pilose spots, and biseriately punctured, punctures large but shallow. Antennæ rufous. Anterior tibiæ with obtuse marginal tooth and at base feebly serrate. Hind femora not spinulose. Length .40—.48 inch; 10—12 mm.

The form of this species is very nearly that of the preceding.

Occurs from Canada to Georgia.

T. sordidus, Lec. Proc. Acad. 1854, p. 211; Harold, loc. cit. p. 177.

This species recalls the form and aspect of *tuberculatus*. The median sulcus of the thorax is feebly interrupted and the costæ are sinuous, the hind angles are subacute. The elytral sculpture is nearly that of *tuberculatus*, but the scales at the summits of the tubercles are much paler. The elytral margin, especially at base, is serrulate. The tip of prosternum is an acute tubercle. The hind femora mutic. The anterior tibiæ above the marginal tooth finely serrulate. Hind tarsi shorter than the middle tibiæ, joints 2, 3, 4 longer than wide. Length .24—.32 inch; 6—8 mm.

Occurs from Canada to Georgia and Kansas.

T. foveicollis, Harold, loc. cit. p. 181.

Ovate. Clypeus at middle subangulate, head obtusely 4-tuberculate. Sides of thorax irregularly arcuate, base narrowed, disc with median ridges strongly sinuous, approximated at middle, united with a transverse ridge, dividing the sulcus into two foveæ, at base, on each side an elongate elevation joining the middle of the median ridges and enclosing a fovea, along the apex on each side a transverse fovea. Elytral tubercles moderately well developed and at their summits erect scale-like setæ, intervals with a very few smaller tubercles, punctate striate and somewhat rugulose. Prosternal process subacute. Anterior tibiæ with small marginal tooth near the angle. Hind femora mutic. Prosternal process in form of an acute tubercle. Length .20—.24 inch; 5—6 mm.

The middle and hind tibiæ have a slight tooth on the outer margin near the middle tipped with several short spinous hairs.

I have before me a specimen that purports to be typical, bearing the label in the writing of Harold, which does not, to my mind, agree with that author's description and in fact is merely a specimen of *terrestris* and which Dr. Leconte informs me was the subject of discussion at the time it was received by him from that author.

In their superficial aspect *foveicollis* and *terrestris* differ nearly as much as *erinaceus* and *sordidus*, for while the former in each case has erect scale-like setæ, the latter has short scales scarcely at all erect.

Occurs in Illinois, Missouri and Kansas.

T. terrestris, Say, Journ. Acad. 1825, p. 192; Lec. Proc. Acad. 1854, p. 212; Harold, loc. cit. p. 179.

This species and the preceding, as may be inferred from the above remarks, are very closely allied, and the only points of difference are that the tubercles in the present species have short scales, the sides of thorax less rounded, more decidedly convergent in front and scarcely at all narrowed at base. The large majority of the specimens are also smaller than those of the preceding species varying in length from .20—.24; 5—6 mm.

Occurs in New Jersey, Pennsylvania and the Gulf States, very rarely west of Ohio.

T. æqualis, Say, New Spec. Ins. Louisiana, p. 5, 1832; Am. Ent. edit. Lec. i., p. 301; Lec. Proc. Acad. 1854, p. 213; Harold, loc. cit. p. 185.

Form elongate sub-ovate. Clypeus rounded, head densely punctured and with a line of rufous setæ in form of an inverted "w." Sides of thorax moderately and equally arcuate, hind angles nearly rectangular, dorsal sulcus very feebly impressed. Elytra punctato-striate, intervals feebly convex and with very feeble tubercles tipped with rufous scales in a double series. Prosternal process rarely in the form of an acute tubercle, usually longitudinally cariniform. Hind tarsi moderately long, the joints 2, 3, 4 longer than wide. Lateral tooth of anterior tibiæ very small, above which the tibiæ are simple. Length .24—.26 inch; 6—6.5 mm.

This species occurs from Canada to Louisiana.

T. fascifer, Lec. Proc. Acad. 1854, p. 213.

This species closely resembles the preceding. The thoracic sculpture is still more obliterated. The elytral tubercles are obliterated and their places supplied by small, round, very regularly placed patches of rufous scales. The hind tarsi are short. The anterior tibiæ bidenticulate externally and serrulate at base. Length .26 inch; 6.5 mm.

The patches of scales are of equal size on all the intervals.

Occurs in California.

T. scaber, Linn, Syst. Nat. edit. xii., p. 573; Harold, loc. cit. p. 183; *variolatus*, Mels. Proc. Acad. 1846, p. 138; Lec. Proc. Acad. 1854, p. 213.

Closely allied to *æqualis*. The thorax is similar in form and sculpture. The elytra have the intervals slightly alternating, the tubercles very feeble and tipped with rufous scales biseriately arranged, the tubercles on the more convex intervals being more elongate and conspicuous than those of the alternate intervals. The hind tarsi are elongate. The anterior tibiæ bidenticulate near the tip on the outer margin and serrulate near the base. Length .20—.28 inch; 5—7 mm.

This species occurs in every quarter of the globe. In our own fauna it occurs from Canada to Texas. The European synonymy has been omitted for obvious reasons.

T. atrox, Lec. Proc. Acad. 1854, p. 214.

This species recalls in its outline *capillaris*, but is much less convex. Clypeus rounded. Thorax similar in form to *unistriatus*, sides moderately arcuate in front, slightly sinuate at base, hind angles acute, surface sparsely punctured, discal channel entirely obliterated excepting a slight impression in front of the scutellum. The elytra have broad shallow striæ, the edges of which are slightly raised and with transverse punctures not closely placed; the intervals are feebly convex and with a row of small punctures moderately closely placed, each bearing a short erect brownish hair. Hind tarsi elongate. Anterior tibiæ bidentate externally the larger tooth median, one more basal smaller and with the margin near the base crenulate. Prosternal tip spiniform. Hind femora spinous along the posterior margin. Length .32 inch; 8 mm.

The prosternum of this species is distinctly spiniform in well preserved specimens, but in the type is scarcely less prominent than in *terrestris*, etc. Its aspect is that of the species with which it is placed, although the surface is entirely without coating as in the two following. It may at all times be known from any of our species by the uniseriate arrangement of the short spinulose hairs of the elytral intervals.

Specimens are known to me from Kansas and Illinois.

This species is evidently closely allied to *Eversmanni* of Europe.

T. laticollis, Lec. Proc. Acad. 1854, p. 213.

Form nearly that of *æqualis*, but very slightly broader. Surface black, shining. Clypeus rounded, head sparsely but moderately coarsely punctured. Thorax more than twice as wide as long, sides moderately arcuate and very feebly sinuate near the hind angles which are rectangular, surface shining, coarsely punctured, dorsal sulcus obliterated except a feeble ante-scutellar impression. Elytra black, shining, punctato-striate, intervals equal, nearly flat, with slight inequalities not amounting to tubercles, each bearing two or three short, erect brownish spiculæ placed in a transverse row. Prosternal tip feebly convex. Hind tarsi moderately long. Anterior tibiæ feebly tridenticulate on the outer edge. Length .26 inch; 6.5 mm.

The slight inequalities which, in this species, replace the elytral tubercles of others appear to be rather transverse folds and are moderately distantly placed. The appearance of this species is totally unlike anything in our fauna.

One specimen, New York.

T. striatus, Mels. Proc. Acad. 1846, p. 137; Lec. Proc. Acad. 1854, p. 213.

Black, shining. Sides of thorax feebly arcuate, posteriorly not sinuate, hind angles rectangular; disc moderately densely punctured, median sulcus obsolete. Elytra black, shining, deeply striate, striæ coarsely and moderately closely punctured, intervals convex and with fine punctures placed in pairs, which bear very short pale setæ. Hind tarsi rather short. Anterior tibiæ finely bidenticulate externally and serrulate at base, apical angular tooth deeply emarginate. Tip of prosternum in form of a short carina. Length .24 inch; 6 mm.

One specimen, Pennsylvania.

Descriptions of New Species of DIURNAL LEPIDOPTERA found in North America.

BY W. H. EDWARDS.

Argynnis Rhodope, n. sp.

Primaries of median width, moderately arched, straight on hind margin.

Male.—Expands 2.2 inches. Upper side deep red fulvous, the basal portion of both wings up to the mesial band dark brown; hind margins bordered by two heavy parallel black lines, which enclose fulvous spaces between the nervules; on primaries these lines are frequently confluent, then forming a broad band; the submarginal black spots lunular, confluent, resting on the marginal lines throughout and enclosing sub-ovate fulvous spots; the other markings on primaries as in allied species, but heavy, very much as in *A. Monticola;* secondaries have submarginal black spots equal in size to those on primaries; the mesial band narrow, confluent; the black discal spot oval, with a narrow, deep, fulvous sinus; beyond to base the ground is black in the cell and for some distance on either side of cell, covered by partially brown scales, and on this, next anterior to the mesial band, in the upper discoidal interspace, is a long fulvous spot, and on the sub-costal interspace a second, smaller; fringes alternately luteous and black, the black prevailing on primaries.

Under side of primaries deep red along the whole hind margin quite up to the line of rounded spots; sometimes the basal portion up to the mesial band is of same hue, but in other cases it is paler; the sub-costal and discoidal interspaces as far as the red marginal space being yellow, as is also the posterior part of cell; the sub-marginal black spots diffuse, the lower ones produced nearly to the rounded spots; the enclosed spots small, triangular, rather lunular next inner angle, and the upper five or six either yellow with a few silver scales, or well silvered; on costal margin three sub-apical spots, either yellow or silvered.

Secondaries uniform deep red from base to margin, except that sometimes there is a narrow pale space between the two outer rows of spots, as of a yellow sub-color, washed with red; in some cases the middle of the wing, next anterior to the second row of spots, is much covered with black; the marginal spots well silvered, narrow, elongate, lunular posteriorly, the others sub-ovate; the spots of the second row are nearly equal in size, excepting the fourth, which is minute; the first three, the fifth and sixth, sub-quadrate, the seventh a parallelogram, the eighth, on the margin, nearly or quite obsolete; all heavily edged above with black; these spots either well silvered or yellow-white sprinkled with scales of silver; in the third row are five similar spots, the first, fourth and fifth nearly equal, lunate, the second a point, sometimes wanting, the third sub-triangular edged posteriorly by black; all heavily edged above with same color; in the cell a small rounded spot, and at the base of median nervure an oval, both ringed with black; patches of silver at base of cell, at origin of subcostal, and on shoulder; abdominal margin very lightly silvered; body above black covered with brown-fulvous hairs; beneath light fulvous, abdomen buff; legs fulvous; palpi fulvous, buff at base, at the sides black hairs; antennæ fuscous above, ferruginous below; club black, ferruginous at tip.

Female.—Expands 2.4 inches. Upper side of a pale fulvous, obscure at base; markings similar to male but the sub-marginal fulvous spots paler than the ground color; under side as in the male.

From 3 ♂, 1 ♀, taken in British Columbia, in 1873, by G. R. Crotch, Esq.

Satyrus Phocus, n. sp.

Male.—Expands 1.6 to 1.8 inch. Upper side uniform brown, of medium color; primaries have one small black ocellus in upper discoidal interspace, sometimes in a narrow yellowish ring, and with a white central dot, but in most cases this last is wanting, and the ring represented by a pale shade of brown, and sometimes is altogether wanting; occasionally there is a second ocellus, smaller than the other in lower median interspace, black without pupil.

Under side of primaries much the same shade as above, sometimes tinted with yellow; of secondaries rather darker brown than above, especially over the basal half of the wing; hind margin preceded by a dark common line often obsolete; both wings reticulated with fine, abbreviated, darker brown lines and streaks; the ocelli on primaries repeated, enlarged, with small white pupils and well defined yellow irides; secondaries have two minute black spots, scarcely more than points, one in upper discoidal, the other in lower median interspace, each with white dot; traces of such a spot are sometimes seen in submedian interspace.

Body con-colored; legs yellowish; palpi fuscous; antennæ fuscous above, cretaceous below; club fuscous, ferruginous at tip.

Female—Unknown.

From several males taken at Lake Labache, British Columbia, by G. R. Crotch, Esq., in 1873.

This species is of the size of small *Nephele*, and is plainer colored and with fewer spots. In same vicinity were taken specimens of *S. Boopis*, Behr. Also of *Colias Philodice*, and *Argynnis Aphrodite*, neither of which have been known by me hitherto from the Northwest coast. Also one specimen of *Vanessa J album*, and three females of a *Colias*, probably *Scudderii*, Reakirt; specimens of *Arg. Chariclea*, or *Boisduvalli*, considered by some to be a dark var. of *Chariclea*. On Bald Mountain near Lake Labache were taken diminutive specimens of *Argynnis Bischoffii*, Edw., hitherto reported only from Kodiak. Near Lake Labache also were taken *Arg. Bremneri*, Edw., as well as at Victoria, Vancouver's Island. On this Island a fine specimen of *Chionobas Gigas*, Butler, was taken, and specimens of *Colias Interior*, Scudder. Among the *Pieridæ*, taken by Mr. Crotch, were *Pallida*, Scudder (Syn. *Castoria*, Reakirt), and *Venosa*, Scudder, probably syn. with *Yreka*, Reakirt. Also *Oleracea*; all these from Lake Labache.

Argynnis Nitocris, n. sp.

Male.—Expands 3 inches. Upper side bright fulvous, much obscured by brown from base to middle of disk, except upon a portion of cell of primaries; both wings edged by two parallel, fine, black lines, which on secondaries enclose a rather broad fulvous space, on primaries a narrower space, divided by the black nervules; anterior to these lines on primaries a series of black lanceolate spots, the three or four next apex connected and resting upon the inner line, the others separated and not touching the line; on secondaries a series of lunular separated spots; the rounded extra-discal spots as in *Nokomis*; small on secondaries, rather large on primaries; the markings on disk and to base as in *Nokomis*, heavy on primaries, light on secondaries, the discal band on the latter broken into small, separate lunules; the spot on the arc like the letter S; fringe of secondaries light fulvous, of primaries deep fulvous, black at tips of nervules.

Under sider of primaries cinnamon-red from base to hind margin and over entire wing except a small sub-apical space across the sub-costal nervules, which is bright ochraceous-yellow, and a brown patch just anterior to this on costal margin; the black markings repeated; the five lanceolate spots next apex enclosing silver lunules; three silver spots on the brown costal patch, one of them minute.

Secondaries deep ferruginous from base to outer edge of the second row of spots; between this and the outer row, a clear space, as in *Cybele*, bright ochraceous-yellow; the seven sub-marginal spots narrow segments of circles, edged above with ferruginous; the second row seven, rather small, the 1st, 2d and 6th equal, sub-rotund; the 3d and 5th long oval; the 4th minute and 7th sub-lunate; all heavily edged above with black; the third row of three large spots, the 1st and 3d sub-lunate, the 2d rounded; edged above with black; in cell a round spot, and below cell an oval, both ringed with black; all these spots well silvered; a silver patch at base of cell, and another at base of sub-costal; shoulder and abdominal margin lightly silvered.

Body above fulvous, beneath fulvous with buff and gray hairs; legs fulvous; palpi fulvous, buff at sides; antennæ fuscous above, fulvous below; club black, tip fulvous.

Female.—Unknown.

From one male taken at White Mountains, Arizona, by Lieut. Henshaw of the exploring Expedition under Lieutenant Wheeler, August, 1873.

Melitæa Acastus, n. sp.

Male.—Expands 1.5 in. Size and form of *M. Palla*; paler fulvous; the spots and bands closely like that species, and on a fuscous ground; fringes similar also.

Under side of primaries pale fulvous, reddish next base and across the disk next the submarginal spots, yellow fulvous at extremity of and below cell, and along the origin of the nervules; a fuscous patch on middle of inner margin, and four fuscous, rounded spots forming a bent oblique line reaching from costal edge to median nervule; hind margin edged by a narrow fulvous band, slightly wavy on inner edge; submarginal spots large, lanceolate, yellow-white, the three next inner angles suffused with fulvous; the three sub-apical spots yellow-white on fuscous ground; costal edge yellow-white.

Secondaries nearly covered with large yellow-white spots, in bands, separated by fuscous lines; the marginal edge bordered as in primaries; the submarginal spots lunular, the spots of second row small, sub-rectangular, and each except the two outer having a minute orange spot near its posterior edge, sometimes represented by a few scales only; the spots of the 3d, or discal row, long, conforming to the interspaces, almost a continuous band, the nervules that divide them being but partially fuscous; the anterior portion of these spots, on both margins, cut off by an irregular black line; the 4th row is basal and is separated from the 3d by a broad space, and consists of four irregular, confluent spots; the outer edges of the band thus formed edged with black; the 4th spot confluent with the con-colored abdominal margin; in cell an orange bar on either side the triangular spot; a similar bar in the interspace above cell, and an orange lunule in submedian interspace next submedian nervure, and a small orange triangle at origin of lower branch of median; an orange bar also next the basal side of the 4th band. Body above black with fulvous hairs; rings of abdomen edged with yellow; below, thorax and abdomen, yellow-white; legs pale fulvous; palpi same above, yellow-white in front; antennæ fuscous, with narrow white rings, below orange cretaceous next base; club fuscous, orange below and at tip.

Female.—Expands 1.9 inch. Color of upper side sometimes like male, sometimes paler; in some individuals the submarginal spots and the third, or discal row, are paler than the rest of the wing; and the three outer rows on primaries likewise paler; under side similar in color and markings to male.

From Montana, Nevada and Southern Utah. Specimens have been received from Dr. Hayden's Expeditions and Lieut. Wheeler's of 1872. Also from Henry Edwards, Esq. This species is at once distinguished from its allies by the yellow-white under surface, especially of secondaries, this color nearly occupying the whole wing.

Synchloe Crocale, n. sp.

Male.—Expands 1.7 to 1.9 inch. Upper side brownish-black, spotted with white; primaries have a sub-marginal row of points, sometimes complete from apex to lower branch of median, but usually in part obsolete, the two spots on first and second median interspaces only appearing; a sinuous extra-discal row of points or small spots across the entire wing, seven in all, but sometimes the one next inner margin accompanied by an eighth; a discal row of conspicuous spots, also sinuous, usually incomplete by the absence of one spot from upper median interspace,—this spot when present, minute; and a narrow spot in cell, often wanting; secondaries have a transverse row of spots on middle of wing, which are regular, narrow, elongated, and equal; at anal angle a fulvous patch, which extends a little distance up the abdominal margin; fringes white, black at tips of nervules.

Under side more decidedly brown; the spots on primaries repeated; the sub-marginal enlarged, mostly lunate; the extra discal also enlarged; the discal nearly as above; two spots in cell, one near arc, one near base; a third below the origin of lower branch of median; shoulder ferruginous; secondaries have a sub-marginal series of yellow lunules; a broad yellow band across disk; a narrow yellow stripe near base, from costal edge to sub-median nervure; half-way between sub-marginal spots and discal band, a series of yellow points, tortuous, commencing on costal margin near the band, crossing the wing in a double curve, the last point being on sub-median interspace; these marks vary from points to conspicuous spots, and sometimes are nearly or quite obsolete; in middle of cell a yellow point; anal spot as above, ferruginous; the upper part of abdominal margin edged with yellow; a yellow patch on shoulder.

Body above blackish-brown, below gray-brown; legs ferruginous; palpi white in front, black above and at tip; antennæ fuscous, finely annulated with white; club black above, gray below, fulvous at tip.

Female.—Expands 2.1 inches. Similar to male; in the only specimen examined, the fulvous patch at inner angle of secondaries was absent; below cell of primaries two white points.

From several males and one female, taken at White Mountains, Arizona, in 1873, by Mr. Henshaw, of Lieut. Wheeler's Expedition.

I submitted one of these specimens to Mr. A. G. Butler for determination, and he informed me that two examples from Mexico were in the British Museum collection, and that they were regarded by him as a distinct species, allied to *Lacinia* and *Hippodrome*.

Geirocheilus Tritonia, n. sp.

Male.—Expands 2.3 inches. Upper side velvety, blackish-brown, changing to brown on hind margin of primaries with an olivaceous tint at apex; costal edge of primaries near apex yellow-white; beyond disk a transverse row of four white points, set in middle of the upper discoidal and three next lower interspaces; the last point sometimes wanting on upper side; secondaries have a broad marginal band of dull ferruginous, even edged within, reaching the margin on that part of wing between sub-median nervure and the upper branch of median; beyond this last receding from the margin, but usually continued past the upper branch of sub-costal and gradually diminishing to a point, sometimes, however, terminating squarely at the lower branch of same nervure; through this band runs an indistinct undulating brown line, parallel to and near the margin; beyond upper branch of median the space between this line and margin is brown, color of apex of primaries; fringes of primaries black at tips of nervules, yellow-white in the interspaces, of secondaries nearly all fuscous, there being but a few gray hairs in each interspace.

Under side smoky-brown; the white spots repeated, enlarged three-fold, each forming the pupil of a rounded black ocellus; secondaries have a broad extra-discal band, ferruginous and lilac, with scattered yellow scales, on the posterior half of wing, lilac on brown ground apically; on the anterior edge of the band, upon small ferruginous spaces free from lilac, is a row of straw-colored points and spots, commencing in a point on the lower sub-costal interspace and continuing to sub-median nervure, just before which are two points; the three spots on the three median interspaces crescent or V-shaped; in some cases these larger spots re-appear on upper side; posterior to the band, the sub-marginal area is brown, sharply lunated, each lunation forming internally a semi-circle, and through all runs a streak of ferruginous, more or less irrorated with yellow; sometimes the streak is limited to the three interspaces next abdominal margin.

Body blackish-brown; legs brown and gray; palpi gray in front, blackish above and at tip; antennæ brown, grayish next club, gray below; club yellowish.

From White Mountains, Arizona, and taken by Mr. Henshaw, in 1873. This species is near *Patrobas*, Howitson.

EREBIA HAYDENII. Edw. U. S. Geo. Survey of Montana etc. 1872.

Male.—Expands 1.6 inch.

Upper side fuscous, immaculate; underside a shade paler, much irrorated with grey scales; primaries immaculate; secondaries have a complete series of black ocelli along the edge of hind margin, one in each interspace; each ocellus narrowly ringed with ochraceous, and having a minute white pupil.

Found at Yellowstone Lake.

Descriptions of New Species of United States COLEOPTERA.

BY GEO. H. HORN, M. D.

This short contribution to Coleopterology was begun with the intention of making known the new species brought by Mr. G. R. Crotch, belonging to the families to which the author had more especially given attention. There being many new species in these families from other parts of the country, this opportunity has been made use of to add descriptions of these, as well as to make known some synonyms, and to present synoptic tables of several genera, in order that the species may be more readily recognized.

The attention of collectors in various parts of the country is called to the species of *Corphyra*. The number occurring in California alone is nearly equal to that of the entire region east of the Rocky Mountains, and this fact gives rise to the suspicion that the species of the latter region have not been properly collected and examined, owing to their great superficial resemblance.

The collections of Mr. Crotch show that, although very much has been done in the development of the Coleopterous fauna of the Pacific region, much remains to be done, especially in the smaller species, and to these the attention of collectors is particularly requested.

CYCHRUS, Fab.

C. mimus, n. sp.—Black. Head smooth, transversely moderately convex, clypeus with slight triangular impression at middle. Thorax cordate, not longer than wide, sides arcuate in front, sinuate posteriorly, hind angles rectangular, surface sub-opaque, median line finely impressed, basal transverse impression deeper, margin finely reflexed. Elytra oval, slightly more narrowed posteriorly, convex, finely striate, striæ with coarse, moderately deep but not close punctures. Body beneath smooth, shining, reflexed portion of elytra sparsely punctate. Length .56—.68 inch; 14—17 mm.

The males of this species have the anterior tarsi with three joints dilated and pubescent beneath, and in the group thus characterized it is allied to *striatus* and *obliquus* especially, differing from the former by its broader thorax and more deeply punctured elytral striæ; from the latter by the sides of thorax not being oblique. The latter species (*obliquus*) has not the triangular impression at middle of clypeal margin and has the middle portion of the head more convex. With the exception of the tarsal character of the male, this species cannot in description be distinguished from *punctatus*, the only noticeable superficial difference being that *punctatus* has the striæ much less and the punctures rather more distinct. The resemblance between these two species has a parallel in another portion of the series, *ventricosus* and *alternatus* of which the females are at times very troublesome to separate.

Numerous specimens were collected by Mr. Crotch along the Santa Ana River, at San Bernardino, California.

HETÆRIUS, Erichs.

H. tristriatus, n. sp.—Form broadly oval, robust; color castaneous, shining; surface sparsely clothed with recumbent pubescence intermixed with moderately long yellowish hairs. Head sparsely punctured, front concave. Thorax wider than long, slightly wider at base than apex; on each side a deep oblique groove, deeper posteriorly, dividing the surface into a discal and lateral portions; discal division shining, very sparsely punctured; lateral portion divided again in two by a deep transverse groove, the posterior being elongate oval, smooth, shining, the anterior flattened but irregular, dilated in front, and with sparsely punctured surface. Elytra with the subhumeral (or marginal) stria extending two-thirds the length of the elytra, first dorsal entire arched at tip toward the third, second very slightly shorter, third entire, striæ deeply impressed at basal end, their outer margins being elevated. Propygidium sparsely punctured, pygidium smooth with few punctures at the sides only. Prosternum at tip deeply emarginate, stria extending entirely around the tip, anteriorly moderately consticted and at extremity truncate and perforate. Mesosternum with distinct marginal line. Metasternum and abdomen smooth, shining. Length .10 inch; 2.5 mm.

The appearance of this species is very much that of *morsus*, but it is smaller and relatively broader, the thoracic angles are less dilated in front although of similar aspect. The striation of the elytra is entirely different and the legs of the present species very much shorter, resembling those of our other species.

Several specimens of this species were collected by Mr. Crotch, at Calaveras, California.

PAROMALUS, Erichs.

P. difficilis, n. sp.—Oblong oval, sub-depressed, piceous, shining. Thorax and elytra moderately coarsely but not densely punctured. Elytra without traces of dorsal striæ, sutural moderately impressed, extending two-thirds to base. Body beneath much more finely and sparsely punctured than above, mesosternum with entire marginal stria. Length .08 inch; 2 mm.

This species possesses characters of *bistriatus* and *seminulum*. Of the former it has nearly the form and a similar mesosternal line, and with the latter it agrees in the possession of the abbreviated sutural stria.

Several specimens collected by Mr. Crotch, Mojave, California.

NOSODENDRON, Latr.

N. californicum, n. sp.—Form broadly oval, moderately convex, black, feebly shining. Head moderately coarsely and closely punctured. Thorax less densely punctured than the head or elytra and more shining, sides very feebly arcuate Elytra subopaque, coarsely, densely and rather deeply punctured, punctures at sides denser but smaller, and with small, round tufts of short, erect yellowish scale-like hairs arranged in fine series on each elytron (those on the dorsum usually lost). Body beneath opaque. Mesosternum very coarsely punctured, abdomen more finely and sparsely punctured. Length .18 inch; 4.5 mm.

This species is of the same form and size of our Eastern species, from which it differs by its more opaque and closely punctured surface and the possession of the elytral tufts. In the latter character it resembles the transatlantic species, *fasciculare*, with which I have been unable to compare it.

One specimen from California, kindly given me by Mr. Ulke; others were collected by Mr. Crotch, at Calaveras, in the same State.

ESTHESOPUS, Esch.

E. bicolor, n. sp.—Oblong, rufo-piceous, thorax and head rufous, elytra black, legs testaceous. Head sparsely punctured. Thorax slightly longer than wide, in front feebly arcuate, at base slightly broader, surface shining, sparsely punctured. Elytra deeply striate, striæ coarsely and deeply punctured, intervals convex, irregularly biseriately punctulate and obsoletely reticulate. Body beneath sparsely and finely punctured. Antennæ and palpi testaceous. Claws broadly toothed at base. Length .22 inch; 5.5 mm.

The surface is very sparsely pubescent. The thoracic punctures are those of the coarser series, the finer intermediate punctures being scarcely visible. Differs from our other species by its color.

One specimen presented by Mr. Edw. Tatnall, Jr., by whom it was collected in Delaware.

Cardiophorus mimeticus, Horn, (Trans. Am. Ent. Soc., 1872, p. 147,) appears to be merely a male of *C. Edwardsii*, Horn. The former species has the humeri only red, while in the latter the extension of that color embraces the entire elytra, except an elongate, fusiform, sutural black stripe. The former name should be suppressed. The determination is founded on a moderate series brought by Mr. Crotch.

ELATER, Linn.

E. Phelpsii, n. sp.—Form of *cordifer*, slightly more elongate and convex. Head black, densely punctured and opaque, sparsely clothed with short, black, erect hairs. Antennæ not longer than head and thorax, joint 3 slightly longer than 2, and together not longer than 4, outer joints triangular. Thorax not longer than wide, sides in front feebly arcuate, hind angles not divergent and obtusely carinate, surface densely and moderately coarsely punctured and subopaque, with short black hairs. Scutellum black. Elytra sanguineous with apical irregularly cordiform spot involving the entire apex, surface sparsely clothed with short, erect pubescence agreeing in color with the surface, feebly striate, striæ moderately coarsely punctured, intervals flat, sparsely punctulate. Body beneath black, sparsely punctured and with short, black hair. Legs black, tarsi rufous. Length .36 inch; 9 mm.

This species is allied to *cordifer* and *Behrensii*, and differs from the former in being less depressed and the thorax more densely and coarsely punctured and opaque. In *cordifer* the apical spot is exactly cordiform in shape and does not attain either the lateral or apical margins, and there is also an ill-defined spot on each elytron behind the scutellum. *Behrensii* has the thorax shining and much more sparsely punctured and the hind angles more strongly carinate.

Specimens were collected by Mr. Crotch, at Tahoe, California. The species is dedicated with pleasure to Mr. E. L. Phelps, through whose skilled assistance Mr. Crotch was enabled to accomplish such good results.

GLYPHONYX, Cand.

G. mimeticus, n. sp.—Elongate, rufo-testaceous, sparsely pubescent. Head coarsely, deeply and densely punctured. Thorax longer than wide, sides parallel, anterior angles rounded, hind angles very feebly divergent, and with a very long carina, extending in front of the middle, very close to the marginal line posteriorly; basal impression moderate; surface shining, sparsely and moderately coarsely punctured. Elytra slightly wider than the thorax, deeply striate, striæ coarsely, deeply and closely punctured, intervals convex, more elevated at apex, very sparsely puncticulate. Thorax beneath more coarsely punctured than above, body and abdomen more finely and densely punctured. Length .24—.26 inch; 6—6.5 mm.

In one specimen before me, smaller in size than the other, the eighth elytral interval is very strongly elevated at tip, forming a well marked carina. This species may be distinguished from either of those proviously known by its more elongate form, more convex elytral intervals and the sexual (?) character above indicated. At first sight the species might be taken as a *Horistonotus*, and its resemblance to *H. Uhlerii* or *Esthesopus humilis*, is very great.

Two specimens from Texas were kindly presented by Mr. William Jülich, of New York.

Limonius cribricollis, Horn, should be suppressed, the specimen on which it is founded being immature and without any doubt *Melanotus longulus*, Lec., in which the serrations of the claws are barely visible, except with high power.

OESTODES, Lec.

O. puncticollis, n. sp.—Form slender, surface sparsely clothed with very short pubescence. Head very densely and coarsely punctured, black; antennæ (♂) longer than the head and thorax, subserrate. Thorax black, moderately shining, longer than wide, sides very feebly arcuate, hind angles slightly divergent and moderately strongly carinate and an extra-angular carina parallel with the margin, short but well defined, base of thorax bisinuate and opposite the scutellum deeply emarginate, the emargination obtusely toothed at middle; surface strongly convex, coarsely, deeply, moderately densely and evenly punctured. Scutellum oblong, shining, slightly impressed longitudinally. Elytra testaceous, suture and base piceous, surface moderately shining, (sutural stria alone entire), vaguely and irregularly punctured and at base with a slight humeral oblique impression. Body beneath piceous, thorax less coarsely punctured than above, metasternum and abdomen sparsely and finely punctured, shining. Legs testaceous. Length .24 inch; 6 mm.

This species resembles *tenuicollis*, Rand., in form and coloration, and appears to differ only in the punctuation of the thorax, which is shining, and nearly smooth in *tenuicollis*, while in the present species it is very coarsely, deeply and rather densely punctured.

One specimen collected by Dr. Elliot Coues, near the northern boundary of Dacota, while naturalist of the North Western Boundary Survey.

APLASTUS, Lec.

Several new species having appeared, it seems advisable to present some scheme, by which they may be distinguished, founded on characters least subject to variation. The following will serve for those at present known:

Third joint of antennæ similar in size and shape to the fourth.
  Antennæ slender, feebly serrate, three basal joints only pilose; sides of thorax parallel, not margined, hind angles strongly divergent. **angusticollis.**
Third joint of antennæ always much smaller than the fourth, sometimes globular, never triangular; antennæ with short erect hairs.
  Thorax not margined.
    Antennæ strongly serrate, joints 2, 3 very small nearly equal, together slightly longer than half the fourth.
      Elytra scarcely striate, thorax very sparsely punctate.... **tenuiformis.**
      Elytra moderately deeply striate, thorax coarsely and moderately densely punctate... **corymbitoides.**
    Antennæ serrate, joint 3 more than twice the length of 2, and together nearly as long as the fourth.. **speratus.**
  Thorax with the sides distinctly margined, at least at base.
    Form slender, tarsi slender and as long or longer than their tibiæ. Color ferruginous. Pubescence coarse.................. ....**optatus.**
    Form shorter, less slender, thorax more convex, tarsi never as long as their tibiæ. Color piceous. Pubescence fine........ ....**molestus.**

A. angusticollis, n. sp.—Form slender, color ferruginous, sparsely clothed with short cinereous pubescence. Head coarsely but not densely punctured, vertex slightly impressed. Eyes more prominent than the sides of thorax. Antennæ feebly serrate, three basal joints only hairy, second joint small, oval, third similar to and nearly as long as the fourth. Thorax quadrate or slightly longer than wide, sides parallel not margined, hind angles acute strongly, sometimes very suddenly divergent, acutely carinate, surface convex, sparsely punctured. Elytra as wide at base as thorax, elongate, feebly convex, sides very feebly arcuate, gradually narrowing to apex, surface obsoletely striate, intervals feebly convex, moderately densely punctured and sparsely pubescent. Body beneath darker than above and similarly punctate and pubescent. Tarsi slender, as long as their respective tibiæ, hind tarsi somewhat longer. Length .50—.56 inch; 11.5—14 mm.

This species is the most slender of the genus and is readily known by the characters in the table.

In the terminal ventral segment several characters are plainly visible. In those, which I take to be males, the last ventral segment has the sides slightly oblique near the tip, while the tip is feebly emarginate, in the other sex the segment is oval at tip and entire.

Numerous specimens were taken by Mr. Crotch, at San Diego, California.

A. tenuiformis. n. sp.—Form slender, color piceo-testaceous or ferruginous, sparsely clothed with fine cinereous pubescence. Head coarsely and moderately densely punctured. Eyes not more prominent than the sides of thorax. Antennæ strongly serrate, sparsely clothed with short erect hairs, second and third joints small, globular and nearly equal in size, and together scarcely longer than half the fourth. Thorax subquadrate, slightly longer than wide, sides very feebly arcuate and slightly divergent, not margined, hind angles acute, moderately strongly divergent and acutely carinate, surface convex, coarsely but not densely punctured, median line usually feebly impressed. Elytra as wide at base as thorax, sides gradually narrowing to base, surface moderately convex, obsoletely or not at all striate, interval scabropunctate. Body beneath more shining than above, sparsely punctulate and pubescent. Tarsi slender as in the preceding species. Length .44—.50 inch; 11—12.5 mm.

The males have the sides of the last ventral segment slightly oblique near the tip and the tip truncate.

The three specimens in my cabinet are from Nevada and parts of California unknown to me.

A. corymbitoides, n. sp.—Piceous, moderately shining, sparsely clothed with short, grayish silken pubescence. Head densely and coarsely punctured. Antennæ strongly serrate, with short erect pubescence, joints 2, 3 small, oval, the third somewhat the larger and together not longer than half the fourth. Thorax slightly longer than wide, convex, coarsely but not densely punctured, median line feebly impressed, sides not margined, anteriorly feebly arcuate, hind angles moderately divergent, carinate. Elytra as wide as thorax, sides gradually convergent, moderately convex, surface finely but rather deeply striate, striæ indistinctly punctate, intervals moderately convex, moderately densely and rather roughly punctate. prosternum in front of coxæ obtusely carinate. Body beneath sparsely punctate and pubescent and more shining. Length .50 inch; 12.5 mm.

The males have the last ventral segment slightly oblique at the sides and very feebly truncate at tip. The last ventral of the female is not oblique and is very slightly prolonged and oval at tip, the difference between the two sexes in this respect is barely discernible.

By the form of the antennæ this species is allied to *molestus*, *optatus* and *tenuiformis*; it differs from the first two by the absence of any marginal line, and from the latter by its less slender form and rather deeply striate elytra, and from all by the thorax more coarsely and densely punctured. Its form is nearly that of the male of *Corymbites cylindriformis*.

All the species of this genus have the last joint of the antennæ rather suddenly narrowed near the tip, presenting the appearance of the false joint so often seen in *Ludius*; in *molestus*, however, this character is barely perceptible.

Specimens were collected by Mr. Crotch, at Los Angeles, California.

A. speratus, Lec.—In this species the thorax is distinctly longer than wide, the sides feebly and the hind angles more strongly divergent. The third joint of the antennæ is nearly twice as long as the second, and the two together nearly equal to the fourth. The elytra are very feebly striate, the intervals sparsely clothed with short but coarse pubescence which converges from each side of the interval to the middle and forms, apparently, lines of pubescence. The tarsi are slender and as long as their respective tibiæ. Length .56—.62 inch; 14—15.5 mm.

Occurs at Tejon and Los Angeles, California.

The sexual characters are the same in this species as in *angusticollis*. The antennæ are clothed with short erect hairs.

A. optatus, Lec.—Thorax as long as wide; sides distinctly margined, gradually divergent to base, hind angles slightly more divergent, acutely carinate, surface moderately convex, sparsely punctate and shining. Antennæ strongly serrate, sparsely hairy, third joint elongate oval, larger than the second, the two together equal to three-fourths the fourth joint. Elytra feebly striate, striæ punctured, intervals sparsely punctate and sparsely pubescent. The under surface is sparsely and finely punctate. The tarsi are slender, the anterior four as long, the hind tarsi longer than the tibiæ. Length .60 inch.

The male of this species has the last ventral segment rather deeply sinuate on each side and considerably prolonged at middle, the tip obtusely rounded.

Occurs in the Southern Coast Range and at Tejon, Califoania.

A. molestus, n. sp.—Piceous, feebly shining, sparsely clothed with a very fine pubescence. Head moderately densely and rather coarsely punctured. Eyes feebly prominent. Antennæ serrate, sparsely hairy, second joint very small, third larger, the two together nearly equal to the fourth. Thorax not longer than wide, sides distinctly margined, very feebly arcuate, gradually divergent to base, hind angles very slightly more divergent and carinate, surface rather strongly convex, usually moderately densely punctured. Elytra finely striate, intervals moderately densely scabro-punctate. Body beneath more shining than above, moderately densely punctulate. Tarsi slender but not longer than the tibiæ: Length .48 inch ; 12 mm.

The three specimens before me are probably all males. The last ventral segment has a very feeble sinuation on each side.

Collected by Mr. William M. Gabb, near San Francisco, California.

MALACHIUS, Fab.

M. macer, n. sp.—Form slender. Head black bronzed, smooth and shining, with slight frontal impression. Thorax slightly broader than long, smooth, very shining, large irregular discal spot black, margins pale testaceous. Elytra scarcely wider than the thorax, surface scabrous, moderately shining, black, slightly bronzed, with broad testaceous vitta extending from the humerus to apex. Body beneath black, shining, legs pale testaceous, upper margin of femora and last joint of tarsi black. Lehgth .12 inch ; 3 mm.

Male.—Antennæ black, pectinate, elytra slightly prolonged, and testaceous at tip.

Female.—Antennæ serrate, elytra obtuse and testaceous at tip.

Two specimens collected by Mr. G. R. Crotch, in the region of Lake Tahoe, California.

M. spinipennis, n. sp.—Form of *auritus.* Head smooth, shining, black, front slightly impressed. Thorax broader than long, surface very smooth and shining, black, lateral margins pale red. Elytra slightly broader at base than thorax, surface feebly scabrous, bluish, moderately shining. Body beneath black, shining, legs black with tinge of blue, hind tibiæ testaceous at apical half. Length .18 inch ; 4.5 mm.

Male.—Antennæ black, joints 5—10 pectinate. joints 3, 4 triangular. Elytra sinuate at apex, suture prolonged into a spiniform process and red, beneath which are appendages of curious structure, one being spiniform and projecting backwards under the spiniform process of the suture and concealed by it from above.

Female.—Unknown.

Collected by Mr. G. R. Crotch, at Fort Tejon and Santa Barbara, California.

Two specimens, both males, are before me which differ from each other as follows: the smaller has the antennæ less decidedly pectinate, the elytra more opaque and bronzed instead of blue, and the discal black spots of thorax much smaller.

This species is closely allied to *mirandus*, which, however, has the elytral appendages very prominent and has not the suture prolonged, although there is a small juxta-sutural appendage.

M. Thevenetii, n. sp.—Black, with slightly bluish tinge, thorax rufous with discal black spot. Head smooth, with slight transverse impression. Antennæ black, pectinate ♂. Thorax broader than long, sides feebly, base more decidedly arcuate, hind angles broadly rounded, slightly reflexed, surface smooth, feebly shining. Elytra bluish, opaque, finely scabrous, at tip appendiculate, sutural angle prolonged in a long coriaceous process. Body beneath and legs black with tinge of blue. Length .20 inch; 5 mm.

The elytral appendices are as usual inferior but not concealed entirely from above. The sutural prolongation is limited externally by a deep sinuation of the elytra.

One specimen collected by Dr. Alphonse Thevenet, Mariposa county, California, in the collection of Dr. Leconte.

The addition of the above species requires some modification of the table given by me (Trans. Am. Ent. Soc., 1872, 113) for those species in which the male has pectinate antennæ.

Antennæ pectinate in the male.
Elytra appendiculate in the male.
Appendices entirely concealed from above, suture prolonged in spiniform process, tipped with rufous.......................................**spinipennis.**
Appendices visible from above.
Elytra ♂ either entirely yellow or tipped with pale rufous, sutural angle appendiculate, appendix slender, hind tibiæ yellowish testaceous. **mirandus.**
Elytra ♂ entirely blue, sutural angle with long but not very slender appendix, legs entirely black tinged with blue.................**Thevenetii.**
Elytra not appendiculate in the male.
Elytra bluish with broad oblique vitta from humerus to suture.....**macer.**
Elytra bluish tipped with yellow ♂...**mixtus.**
Elytra entirely black ♂...**Ulkii.**

STIBIA, Horn.

S. ovipennis, n. sp.—Form moderately robust, color piceous black, shining. Head coarsely and densely punctured, punctures slightly strigose, especially in front. Thorax nearly twice as wide at middle as long, apex deeply emarginate, base feebly arcuate, sides regularly and rather strongly arcuate, disc convex, densely and coarsely punctured, punctures slightly strigose near the sides. Elytra regularly oval, slightly more attenuate at apex, one-fourth broader than the thorax and nearly four times as long, convex, with coarse punctures placed in striæ at the middle of each elytron, confused at the sides and near the suture and totally obliterated at apical third. Thorax beneath very coarsely punctured, abdomen obsoletely and very sparsely punctured, mesosternum coarsely punctured, metasternum very coarsely cribrate. Length .14—.18 inch; 3.5—4.5 mm.

Male.—First ventral segment with a broad, shallow, coarsely punctured fovea behind the intercoxal process, last ventral segment nearly smooth.

Female.—First ventral segment slightly punctured at middle, not foveate, last ventral rather coarsely punctured.

This species may be distinguished from *puncticollis* by its smaller size, more robust form, different elytral sculpture and by the smooth abdomen.

Two specimens were collected by Mr. Crotch, at San Diego, Cal.

S. hispidula, n. sp.—Form robust, piceous black, moderately shining, sparsely clothed with moderately long yellowish hairs. Head coarsely, densely and sub-strigosely punctured, middle lobe of clypeus rounded in front. Thorax twice as wide as long, anterior angles acute and very prominent anteriorly, base slightly wider than apex, at middle slightly arcuate, on each side feebly sinuate, hind angles rectangular; sides very feebly arcuate, disc very convex with ante-basal transverse impression; surface coarsely, deeply and rather densely punctured, punctures becoming slightly strigose at the sides. Elytra broadly oval, very convex, moderately coarsely but not densely punctured, punctures with faint tendency to a seriate arrangement. Thorax beneath very coarsely, deeply and rather densely punctured, mesosternum less coarsely punctured, metasternum with very large, deep punctures. abdomen moderately densely punctured. Outer margin of anterior tibiæ slightly spinulose. Length .22 inch; 5.5 mm.

The appearance of this species is somewhat that of *Triorophus*. It may be at once known by its form, the very prominent anterior angles of the thorax, and the sparsely hairy surface.

One specimen collected by Dr. Edw. Palmer, in Utah.

Besides the differences indicated in the table between this genus and *Triphalus* (the longer hind tarsi), it will be observed that the tarsi have coarser and sparser vestiture, and the elytra much narrower epipleuræ. The sexual character above indicated in *S. ovipennis* appears to be unique in the species of the tribe in our fauna. In form the species more closely resemble *Triorophus*, but this has the vestiture of the tarsi spinous beneath, the epistoma with much longer middle lobe which is narrowed at base and clasped by the basal tooth of the mandibles.

The three species forming the genus are related as follows:—

Elytra oblong, punctures larger, arranged in regular striæ.
  Thorax moderately emarginate in front, angles not prominent. **puncticollis.**
Elytra broadly oval, punctures very irregularly arranged.
  Thorax moderately emarginate, angles not prominent............**ovipennis.**
  Thorax deeply emarginate in front, anterior angles very acute and prominent, disc with ante-basal transverse impression...............**hispidula.**

The tribe Gnathosiini, as at present constituted, appears to consist of material entirely too heterogeneous to be associated together. *Craniotus* cannot form part of the tribe for the following reasons. The metasternal episterna are broad, in fact nearly as wide as long, and very much narrowed at the anterior extremity. The intercoxal process is short and very broad, and the antennæ are ten-jointed, the eleventh joint being small and conical and connate with the tenth, and finally the lateral lobes of the front are large, triangular, acute and very prominent laterally. The genus must obviously constitute a distinct tribe nearer the *Epiphysini* than *Gnathosiini*, defined by the characters above noted; it cannot, as suggested by Lacordaire, be associated with *Megagenius*, as this has the metasternal episterna narrower.

With *Craniotus* removed the tribe becomes more homogeneous. It may be observed, however, that while all the other genera have the mandibles grooved above so as to permit them, when closed, to clasp the middle lobe of the epistoma and thus *completely* conceal the labrum (without becoming themselves concealed when viewed from above), *Auchmobius* has the mandibles feebly grooved not clasping the middle lobe of the epistoma, when in repose, allowing the labrum to be partially visible, while they are completely invisible from above. It is also the only genus without supra-orbital ridge, and has the outer joints of the antennæ compressed, broader than long and trapezoidal in form. It might possibly represent another tribe, the form of the antennæ being totally unlike that of any other genus in the earlier groups.

The tribe thus becomes reduced to four genera, the relations of which are as follows:—

- Intercoxal process of abdomen broad, feebly narrowed in front, tip subtruncate or rounded.
  - Tarsi spinous beneath. Hind tarsi with joint 1 equal to 3, 4.
    - Middle lobe of epistoma narrowed at base and clasped by a tooth-like process from the base of the mandibles.................................TRIOROPHUS.
    - Middle lobe of epistoma triangular, rapidly narrowed in front, mandibles without basal tooth ....STIBIA.
  - Tarsi with silken hairs beneath. Hind tarsi with joint 1 equal to joint 4 only.
    - Middle lobe of epistoma narrower in front, mandibles without basal tooth, thorax narrower in front..TRIPHALUS.
- Intercoxal process of abdomen triangular, either acute or oval at tip. Tarsi spinous beneath.
  - Middle lobe of epistoma narrower in front, either oval or truncate...TRIMYTIS.

The above genera all have the prothorax coarsely punctured beneath and the metasternum very coarsely and deeply cribrate, a character entirely unknown elsewhere among our *Gnathosiini*. In *Triorophus* it will be seen that certain specimens are stouter in form, the elytra being more broadly oval, others are more slender and always smaller. The former I find to have a smooth head and the mandibles very decidedly sometimes rather deeply notched. Both the above characters are somewhat variable but hold good with the majority of specimens, and they appear to me to be sexual.

CHILOMETOPON, n. gen.

Body winged, elongate oval. Front trilobed, middle lobe prominent, trapezoidal, feebly clasped by the mandibles and entirely concealing the labrum. Eyes with superciliary ridge, prominent and coarsely granulated. Antennæ longer than head and thorax, slender, joints 8—10 somewhat broader, last joint equal to (*helopioides*) or longer (*abnorme*) than the preceding. Mentum transversely hexagonal, large, anterior angles rounded. Maxillary palpi with last joint elongate triangular. Prosternum not produced behind. Legs slender, anterior tibiæ slender without apical prolongation, tarsi sparsely clothed with short spines, hind tarsi moderately elongate, first joint equal to the third and fourth together.

Two species before me agree in the possession of the above characters.

The genus is referred to *Epitragini* from the form of the front and the elongate metasternum. In both species the thorax is somewhat narrower than the elytra, although not more so than in some of our *Epitragus*. The vestiture of the tarsi is nearly as stiff and spinose as in *Trioroplhus*. The middle lobe of the front is very prominent, truncate in *helopioides*, and oval at tip in *abnorme*, the surface being flat in the former and moderately convex in the latter. Regarding the affinities of this genus with foreign genera I express no opinion; from our own genera of the tribe it is easily known, the tarsal vestiture and superciliary ridge at once distinguish it from *Schoenicus*, with which alone it could be founded. The two species are :—

C. abnorme, Horn (*Trimytis*), Trans. Am. Phil. Soc. 1870, p. 261.—Thorax narrower at base than apex. Las joint of antennæ as long as the two preceding together. Length .26 inch; 6.5 mm.

Collected in Nevada. Cabinet of Dr. Leconte.

C. helopioides, n. sp.—Castaneous, shining, form oblong oval. Head broadly oval. Mandibles and clypeus coarsely and densely punctured, vertex and occiput much more sparsely. Thorax nearly twice as wide as long, apex feebly emarginate, anterior angles acute and very slightly everted, base broadly rounded at middle, feebly sinuate each side, hind angles subacute but not prominent, sides moderately arcuate and slightly divergent to base. Elytra slightly broader at base than thorax, elongate oval, sides moderately arcuate, humeri distinct, surface moderately convex, sparsely punctured, punctures feebly seriately arranged becoming slightly muricate and dense at the sides and apex. Epipleuræ entire. Thorax beneath densely variolato-punctate, mesosternum coarsely and densely punctured, metasternum moderately long, at middle very sparsely punctured, sides and parapleuræ very densely punctured. Abdomen sparsely punctured. Femora coarsely but sparsely punctured. Length .26 inch; 6.5 mm.

This species superficially resembles *Helops convexus*, Lec., and does not differ greatly in form from several species of *Eurymetopon*, e. g. *punctulatum* and *sodale*.

One specimen collected by Mr. E. P. Austin, in California.

CRYPTADIUS, Lec.

At the time of the preparation of the revision of the *Tenebrionidæ* of the United States *Cryptadius* was unknown to me, the type having been lost at sea while being sent for study to Lacordaire. Recently specimens have been collected at San Diego, California, by Mr. G. R. Crotch, and I am enabled to present the following observations:—

Head moderately deeply inserted; epistoma subtruncate at middle and slightly notched on each side; labrum moderately prominent; eyes feebly transverse, coarsely granulated, slightly notched in front and with distinct supra-orbital ridge; mentum large hexagonal, feebly emarginate in front; last joint of maxillary palpi elongate oval, nearly twice the length of the preceding joint; antennæ attaining the hind margin of thorax, first joint stouter, second and fourth equal, third longer, 8—11 slightly broader, the last joint oval at tip. Middle coxæ entirely enclosed without visible trochantins. Intercoxal process narrow, rounded at tip. Epipleuræ moderate entire. Anterior tibiæ with the outer angle prolonged into a long obtuse process, sinuate on its lower margin. Hind tarsi nearly as long as the tibiæ, the first joint longer than the two following combined. Scutellum very small, between the elytra transverse.

C. inflatus, Lec. Ann. Lyc. v., p. 140.—Body black, feebly shining, form broadly oval, robust, convex, apterous. Head coarsely, densely and deeply puncturod. Thorax more than twice broader than long, moderately emarginate in front, anteriorly narrow, sides feebly arcuate, and very narrowly margined, hind angles obtusely rounded, surface densely and moderately coarsely punctured and opaque, punctures at the sides strigose. Elytra slightly broader than the thorax, oval, slightly attenuate at apex, surface convex, moderately densely sub-muricately punctured and in the intervals very minutely alutaceous. Body beneath more shining than above, piceous, very sparsely punctured. Legs rufo-piceous. Length .26 inch; 6.5 mm.

From the above characters it will be seen that its place is with the genera allied to *Eurymetopon* and not with those in which the front is trilobed. The notch on each side of the front is already known in *Eurymetopon*, in fact I can see no character of importance separating the two genera; the robust form, even, being already indicated by *E. convexicolle*, Lec., and *F. bicolor*, Horn. *Cryptadius* should, in my opinion, be suppressed into *Eurymrtopon*.

SCHIZILLUS, n. gen.

The above generic name is proposed for a form belonging to the tribe *Cryptoglossini*, allied more nearly to *Centrioptera*, from which it differs only in having the genæ much broader and the eyes completely divided, the under portion of each eye very indistinctly granulated. The mentum is broader than long, anteriorly truncate and feebly emarginate at middle. Front hemi-hexagonal. The antennæ are 11-jointed, the first short and stout, invisible from above, terminal joint broadly oval, stouter than the preceding.

S. laticeps, n. sp.—Black, sub-opaque, moderately robust. Head sparsely punctured, neck densely and finely granulate. Thorax broader than long, apex moderately deeply emarginate, slightly broader than the base, sides moderately arcuate, sinuate near the base, hind angles rectangular, base very feebly emarginate, surface moderately convex, sparsely punctured and sub-opaque and with a moderately deep, transverse, ante-basal impression. Elytra oblong oval, not wider at base than the thorax, widest at middle, sides moderately arcuate; surface moderately convex with rows of punctures on the disc becoming irregular and sub-muricate at the sides and apex; intervals flat sub-muricate punctate. Prothorax beneath sparsely punctate, prosternum acutely oval, slightly produced, margins slightly reflexed; mesosternum nearly vertical emarginate in front; abdomen sparsely and obsoletely punctate. Legs black, sparsely muricately punctate. Tarsi stout. Length .75—.90 inch; 23 mm.

The thorax of this species is similar to that of *Cryptoglossa laevis*, but less convex, while the elytra resemble in sculpture *Elcodes consobrina*. The head is much broader than in any *Centriopteru* in our fauna.

The specimens, from which the above description was taken, were captured by Mr. Crotch in the Mojave Desert, California.

ELEODES, Esch.

E. vetorator, n. sp.—Black, above sub-depressed, opaque, sparsely clothed with short yellowish hairs. Form broadly (♀) or more elongate (♂) oval. Head sparsely punctured and pubescent. Thorax nearly twice as wide at base as long, apex emarginate not wider than the length of thorax, sides regularly arcuate and gradually narrowed from base to apex, base squarely truncate, surface feebly convex, opaque, sparsely punctured and pubescent. Elytra at base very slightly broader than the thorax and slightly overlapped by it, sides regularly arcuate, gradually narrowing to base and continuing regularly the curve of the sides of the thorax, lateral margin acute at basal third; surface feebly convex, opaque, sparsely pubescent and punctured, pubescence arranged so that the surface appears sub-striate. Body beneath black, shining, sparsely punctured and with slight pubescence. Tarsi spinulose. Length .38—.42 inch; 9.5—10.5 mm.

The spinulose tarsi not dilated in the male, the slight dissimilarity between the spurs of the anterior tibiæ in the sexes (less marked, however, in this species than in any other of the group), the anterior spur of the female larger in every way than the posterior, at once indicate the affinity of this species with those of the *tricostata* group and not with *opaca*, with which a slight superficial resemblance would seem to associate it. It may be at once known from every *Eleodes* in our fauna by its regularly oval form, equally narrowed at the two extremities, the thorax squarely truncate and its sides regularly arcuate and gradually narrower from base to apex.

Numerous specimens of this species were kindly presented by Mr. William Jülichs, of New York, by whom they were procured from Texas.

E. texana, Lec.—From collections recently made in the northern parts of Texas I have become convinced that this species is merely a large variety of *suturalis*, Say.

IPHTHIMUS, Truqui.

I. zopheroides, n. sp.—Black, shining, form strongly recalling *Zopherus*. Head sparsely, between the eyes coarsely and very deeply confluently punctate. Thorax trapezoidal, wider in front, apex feebly emarginate at middle, anterior angles very broadly rounded, sides at anterior third parallel, thence gradually narrowed to the base which is truncate, disc convex longitudinally and transversely, shining, sparsely punctured. Elytra oblong, slightly broader behind the middle, convex, shining and with eight discal and a marginal row of deep, coarse, distantly placed punctures. Body beneath black, shining, mesosternum densely and coarsely punctured, abdomen sparsely punctured and slightly wrinkled longitudinally. Length .80 inch; 20 mm.

The mentum of this species differs notably from that of our other species, being trapezoidal and strongly convex at middle, the usual form being broader with rounded angles, a median groove and on each side slightly concave. This variation taken in conjunction with the general form, which is remarkably Zopheroid would seem to indicate the propriety of separating the species generically. A comparison of the superficial characters shows nothing greatly at variance with the other Iphthimus except the much more convex form, although the thorax is somewhat longer and the hind angles not prominent.

For the unique in my cabinet I am indebted to Mr. A. S. Fuller, who obtained it from New Mexico.

I. serratus, Mann.

This species is introduced to call attention to a curious variety, found by Mr. Crotch, of much greater size than usual. The head and thorax are smoother and more shining, very minutely punctulate, the thoracic margin more broadly reflexed and very irregularly crenulate. The elytra are subopaque and the striæ with the usual punctures reduced to very indistinct longitudinal and transverse wrinkles, the intervals being minutely and not densely punctulate. The specimen is slightly more than an inch long.

NYCTOBATES, Guérin.

N. subnitens, n. sp.—Elongate, black, subopaque. Head very minutely punctulate. Antennæ with third joint nearly equalling the three following together. Thorax slightly broader than long, apex truncate, base very feebly sinuate, sides moderately arcuate in front, narrowed and slightly sinuate near the base, hind angles acute but not prominent, surface moderately convex, sparsely and very minutely punctulate. Elytra broader than the thorax, gradually attenuate at apical third, surface slightly more shining than the thorax with faint rows of minute punctures, the intervals very sparsely and more finely punctured. Body beneath shining, sparsely punctulate, abdomen longitudinally wrinkled. Prosternum between the coxæ convex, and elevated in a slight tubercle at tip. Length .70 inch; 18 mm.

A comparison of this species with either of the others shows a greater length of the third joint of the antennæ. The sides of thorax are more arcuate in front and more sinuate posteriorly. The entire surface is less shining and less distinctly sculptured. The prosternum is narrower and convex longitudinally between the coxæ and elevated in a tubercle at tip, our other species having the prosternum broader nearly flat and not tuberculate at tip. The mentum is also more convex and the anterior angles more distinct.

The unique in my cabinet was given me by Mr. H. Ulke, who obtained it from Arizona.

Scotobænus parallelus, Lec.

The males of this species have the anterior femora stouter than the females, the tibiæ slender at basal fourth and the inner margin covered with small tubercles. The middle and hind femora have a silky pubescent space along their lower edge.

PHTHORA, Muls.

P. americana, n. sp.—Oblong, ferruginous, shining. Head sparsely punctured. Thorax broader than long, apex feebly emarginate, base feebly arcuate and slightly broader than the apex, sides very feebly arcuate, margin thickened and somewhat reflexed, surface shining, sparsely and evenly punctured. Elytra as wide at base as thorax, parallel, moderately deeply striate, striæ coarsely and subseriately punctured, intervals moderately convex, sparsely punctulate. Body beneath paler than above, very sparsely and finely punctulate. Length .12 inch; 3 mm.

The appearance of this snsect is that of a miniature but rather convex *Uloma* It resembles also *Dioedus* more closely, but differs in having the last three joints of the antennæ thickened, while *Dioedus* has but two.

Specimes collected in Oregon were kindly given me by Mr. A. S. Fuller.

SCAPHIDEMA, Redt.

S. pictum, n. sp.—Oval. Head black, surface aeneous sparsely punctate. Thorax nearly twice as wide as long, sides in front feebly arcuate, posteriorly nearly straight and slightly divergent, hind angles rectangular, color black, surface aeneous sparsely punctate, basal impressions extending nearly to middle. Elytra at base broader than the thorax, moderately convex, sides moderately arcuate, surface striate, striæ finely punctured, intervals flat, biseriately finely punctulate and obsoletely reticulate, color yellowish testaceous, with basal black band broad at middle, an irregular sinuous transverse band at middle composed of lines of variable length on the intervals but shortest at the suture, and a subapical oval spot, apical margin piceous. Epipleuræ pale. Body beneath piceous slightly aeneous, sparsely punctulate and shining. Femora piceous, tibiæ and tarsi paler. Length .14 inch; 3.5 mm.

The form of this species is broader than *æneolum* and resembles more nearly that of the European species.

Occurs in Oregon. Henry Edwards.

HELOPS, Fab.

H. arizonensis, n. sp.—Form rather slender, apterous, black, opaque. Head coarsely and rather deeply punctured. Antennæ nearly half the length of the body, outer joints slightly compressed, very slightly shorter. Thorax slightly wider than long, sides feebly arcuate, margin obtuse, apex truncate, base feebly arcuate, hind angles slightly prominent, disc moderately convex, densely and coarsely punctured and opaque, beneath punctured as above. Elytra oblong, humeri obtuse, surface deeply striate, striæ coarsely punctured, intervals convex and finely granulated. Body beneath black, slightly more shining than above, meso- and metasternum coarsely punctured, abdomen finely rugulose and more sparsely and finely punctured. Length .34 inch; 8.5 mm.

By the character given in the table (Revis. Tenebrionidæ, p. 392) this species should be placed near *sulcipennis*, but by its opaque surface and deeply sulcate elytra it differs from every other species in our fauna.

Specimens from Arizona were kindly presented by Mr. C. V. Riley.

EPICAUTA, Redt.

E. sanguinicollis, Lec. Proc. Acad. 1853, p. 344.—Body entirely black, head and thorax red. Head shining sparsely punctured, epistoma and mouth black. Antennæ black, filiform. Thorax not wider than the head, slightly longer than wide, sides parallel, arcuately narrowed in front, moderately convex, median line and ante-scutellar impression feeble, surface shining, rather sparsely but coarsely punctured. Elytra nearly twice as wide as thorax, black, coarsely scabrous, sparsely pubescent with black, with very narrow median stripe, sutural and lateral margins sparsely cinereo-pubescent. Body beneath and legs black, sparsely pubescent. Length .32 inch; 8 mm.

This species should be referred to section A of the revision of this genus (Proc. Am. Phil. Soc. 1873, p. 95), from all the species of which it differs by its color and the arrangement of the elytral pubescence.

One female specimen, collected in Florida, was kindly given me by Mr. Edward Tatnall, of Wilmington, Del.

E. Rileyi, n. sp.—Body black, densely clothed with recumbent ochreous pubescence. Head densely and finely, behind the eyes coarsely punctured rather densely pubescent, between the bases of the antennæ a smooth polished, triangular space and above the eyes and surrounding them on their posterior and upper margins a sinular smooth space terminating at the inner side of each eye in a deep fossa. Thorax subquadrate, sides very feebly arcuate, slightly converging anteriorly, disc feebly convex and with a vague but broad fossa near each front angle, surface densely and finely punctured and densely pubescent, the pubescence in the fossæ shorter (as if shaven). Elytra one-half broader than the thorax, parallel, suture at middle slightly elevated, surface densely and finely punctured, very densely clothed with ochreous pubescence, and on each side of the scutellum at base a narrow black space. Body beneath and legs very densely clothed with a somewhat paler pubescence than above, the abdominal segments at the sides with a small black spot and a similar spot on the middle of segments 2, 3, 4. Length .40 inch; 16 mm.

The eyes of this species are smooth, not at all granulated, although the lenses are distinctly visible from their transparency; otherwise the eyes are similar to the species of section C. The antennæ are rather setaceous as in that group. The rather deep fossæ at the inner sides of the eyes mark this species as one of the most peculiar of the genus. Superficially the species resembles a pale *ferruginea*, and its place in the series is near *caviceps*, forming a section by itself.

The two specimens before me exhibit no marked sexual differences and are probably both females. They were collected in Arizona and presented by Mr. C. V. Riley, of St. Louis, to whom I take great pleasure in dedicating it.

E. Alphonsii, n. sp.—Black, moderately shining. Head shining, sparsely punctured, posteriorly sparsely cinereo-pubescent. Thorax slightly longer than wide, sides in front slightly arcuate, posteriorly parallel, surface shining, sparsely punctured. Elytra black, scabrous, very sparsely clothed with short black hairs, suture and sides narrowly margined with long whitish hairs. Body beneath and legs black, shining, legs sparsely cinero-pubescent. Length .36 inch; 9 mm.

One specimen in the cabinet of Dr. Leconte, collected in Mariposa County, California, by M. Alphonse Thevenet, to whom it is with great pleasure dedicated.

The antennæ of this species being filiform and the joints closely placed, and the eyes moderately broad, coarsely granulated and moderately convex, show the position of this species to be in the same group with *puncticollis* and *oblita.* The narrow sutural and marginal cinereous lines are found also in the group in *sanguinicollis.*

CANTHARIS, Linn.

C. tenebrosa, Lec.

A male of this species is in the collection of Mr. G. R. Crotch, having the antennæ very slightly thickened at middle, barely enough to indicate its position in the group in which it was placed. The antennæ are, however, very short as in many of the species of group I. being barely the length of the head and thorax. The outer spur of the hind tibiæ is stouter than the inner, very obliquely truncate and slightly broader at tip. The following are the abdominal characters:

Male.—Fifth ventral segment broadly rounded, sixth subtruncate and slightly emarginate at middle.

Female.—Fifth ventral broadly rounded, sixth oval and very feebly emarginate at tip.

C. Crotchii, n. sp.—Head entirely black with aeneous surface, coarsely, deeply and moderately densely punctured, especially at the sides, sparsely clothed with erect black hairs. Thorax broader than long, sides regularly arcuate, basal margin slightly reflexed and feebly emarginate at middle, color reddish-yellow, surface moderately convex and shining, very sparsely and unevenly punctured. Elytra one-third broader than the thorax, coarsely scabrous, black with bronzed surface, sparsely clothed with short, black, erect hairs. Body beneath and legs black and slightly bronzed. Outer spur of hind tibiæ slender, very obliquely truncate at tip. Length .30—.40 inch; 8—10 mm.

Male.—Fifth ventral segment very broadly emarginate, sixth moderately emarginate.

Female.—Fifth ventral broadly emarginate, sixth with scarcely evident emargination.

This species is closely allied to *aeneipennis*, next to which it should be placed in the table (Proc. Am. Phil. Soc. 1873, p. 110), and from which it differs by the totally black, coarsely and deeply punctured head.

Collected by Mr. G. R. Crotch, at San Diego, California.

C. insperatus, n. sp.—Black, moderately shining. Head sparsely and finely punctured. Thorax subquadrate, base slightly narrowed, sides in front arcuate, surface moderately convex, median line feebly impressed, very sparsely punctate. Elytra less shining than thorax, finely scabrous. Body beneath black, very sparsely punctate, sparsely cinereo-pubescent. Legs black, punctate, with black pubescence, middle tibiæ slightly arcuate, outer spur of hind tibiæ short, very stout, truncate. Length .80—.90 inch; 20—23 mm.

Male.—Antennæ not stouter at middle, as long as half the body. Last dorsal segment truncate. Fifth ventral acutely and deeply notched, sixth deeply cleft and fimbriate at tip. Hind trochanter with short spine near the tip. Anterior tibiæ with two spurs.

Female.—Antennæ shorter than the male, gradually thicker to tip. Fifth ventral truncate, sixth rounded at tip. Hind trochanter mutic.

This species is almost intermediate in appearance between *meluena* and *moerens*. It belongs to Group II. of my revision (Proc. Am. Phil. Soc. 1873, p. 109), by the form of the antennæ, and to the first section of that group by the short, stout, truncate spur of the hind tibia. The male characters will serve to distinguish the species from any other in the group.

In *C. moerens*, Lec., the outer spur of the hind tibia is slender and acute and the hind trochanter of the male angulate near the distal end, thus approaching the preceding species.

Specimens of the above described species were taken by Mr. Crotch, in the Mojave Desert, California.

XANTHOCHROA, Schmidt.

X. californica, n. sp.—Form slender. Head, thorax, femora and last abdominal segment pale reddish-yellow, body beneath, tibiæ and tarsi black, shining, elytra bluish. Front very sparsely punctured, nearly smooth, occiput distinctly punctured. Antennæ half the length of body, entirely black. Thorax slightly longer than wide, sides in front arcuate, posteriorly slightly sinuate, disc feebly convex, shining, very indistinctly punctured. Elytra bluish, moderately densely scabro-punctate, sparsely pubescent and with three feebly elevated costiform lines, two discal and one lateral, gradually evanescent toward the apex. Body beneath black, shining, very sparsely punctate, dorsal and ventral segments pale rufo-testaceous. Femora and base of tibiæ pale rufo-testaceous, tibiæ and tarsi black. Length .38 inch; 9.5 mm.

One specimen collected by Mr. G. R. Crotch, in California.

CORPHYRA, Say.

Several new species having been brought by Mr. Crotch, the number from the Pacific region now nearly equals that from the entire region east of the Rocky Mountains. Several present characters before unknown, which will appear in their proper places.

The following table contains the Pacific species only:—

Hind tibiæ male slightly arcuate, inner side flattened and obliquely grooved (as in the anterior tibiæ of the *Lamiidæ*) ....**abnormis.**
Hind tibiæ similar in the sexes, slightly, or not grooved.
  Elytra in both sexes rounded at tip or very slightly more acute in the male ....**1.**
  Elytra in male acutely prolonged, subcaudate ....**2.**
1.—Antennæ of male pectinate. Elytra ♂ feebly impressed at tip..**Crotchii.**
  Antennæ of male at most serrate ....**3.**
3.—Elytra at tip ♂ slightly swollen and impressed ....**monticola.**
  Elytra at tip ♂ neither more convex nor impressed ....**4.**
4.—Elytra at tip ♂ pale rufo-testaceous and smoother ....**5.**
  Elytra at tip similar in the sexes and similarly punctured ....**6.**
5.—Thorax red (sometimes with discal black spot?) ....**punctulata.**
  Thorax black ....**funebris.**
6.—Thorax black, elytra vittate and finely punctured ....**vittata.**
  Thorax red, elytra black, moderately coarsely punctured...**inconspicua.**
2.—Elytra black with oblique testaceous vitta ....**Bardii.**
  Elytra entirely black ....**distinguenda.**

C. abnormis, n. sp.—Head black, sparsely punctate. Antennæ black, moderately serrate. Thorax transversely oval, rufous, shining, very sparingly punctate. Elytra black, shining, moderately densely and coarsely punctured. Body beneath black, shining, very sparsely punctate. Legs black. Length .28 inch; 7 mm.

Male.—Elytra at tip not differing from the remainder of the surface in color and punctuation and neither impressed nor convex. Hind femora moderately stout. Hind tibiæ slightly arcuate, inner side slightly flattened and with an oblique groove somewhat similar to that of the anterior tibiæ of the *Lamioid Cerambycidæ.* Fourth ventral segment prolonged in a broad lobe at middle on each side of which the margin is sinuate; fifth segment truncate at middle and with a broad but feeble transverse channel in front of the hind margin, and in front of this the surface is moderately convex; sixth segment feebly prominent. Terminal lobes of penis sheath slightly arcuate, obtuse at tip and not hooked on their inner margin.

Female.—Unknown.

This species is certainly one of the most remarkable in the genus, and indicates a departure of specific characteristics, in a direction wholly unexpected. Superficially it resembles *punctulata.* The female is unknown and probably not distinguishable without great care from that of *punctulata.*

One specimen collected by Mr. Crotch, in California.

C. Crotchii, n. sp.—Head black, sparsely punctured and shining, mouth and palpi testaceous. Antennæ ♂ moderately strongly pectinate from the third joint, black. Thorax rufous sparsely punctured. Elytra (variable in color?) yellowish testaceous, suture, margin and tip narrowly bordered with black, sparsely and rather coarsely punctured and sparsely flavo-pubescent. Body beneath black, abdomen piceo-testaceous (immature?). Legs piceous, femora beneath testaceous. Length .20 inch; 5 mm.

Male.—Elytra at tip black, smooth and with broad shallow impression.

Female.—Unknown.

The elytra in this species may be perhaps entirely black in maturity. It differs from every known *Corphyra* by the pectinate antennæ which resemble those of a *Malachius*.

Collected by Mr. G. R. Crotch, at Chrystal Springs, California.

C. monticola, n. sp.—Head black, shining, sparsely punctured. Antennæ (2 basal joints) piceous. Thorax transversely oval, red, sparsely punctured. Elytra (variable?) pale rufo-testaceous, moderately densely punctured. Body beneath black, legs pale rufo-testaceous, tarsi piceous. Length .26 inch; 6.5 mm.

Male.—Elytra at tip either pale rufous or black, more convex, smoother, and with a distinct but shallow impression.

Female.—Unknown.

Resembles at first sight some of the varieties of *punctulata*, from which the male characters and pale legs at once distinguish it; differs also from *elegans* by the entirely black abdomen. The elytra may become entirely black except at tip in male.

Collected by Mr. Crotch, at Calaveras, California.

C. punctulata, Lec. Ann. Lyc. v. 151.

California.

C. funebris, Horn, Trans. Am. Ent. Soc. 1871, p. 286.

California. I have suspected that these species might be varieties of one. Varieties of *funebris* with pale elytra have been brought by Mr. Crotch and also a specimen apparently of *punctulata*, with a large discal black spot on the thorax.

An examination of the penis-sheath shows, however, that while in the former the processes at the tip are parallel and contiguous, those of the latter are somewhat longer and divergent. This organ appears to vary somewhat between all the species.

C. vittata, Horn, loc. cit. p. 279.

Varieties of this species may occur with the elytra entirely testaceous and the suture alone broadly black. The legs may be also entirely pale, and the antennæ rufo-piceous.

Occurs at Chrystal Springs, California.

C. inconspicua, n. sp.—Head black, moderately coarsely but sparsel punctured. Antennæ ♂ subserrate, entirely black. Thorax rufous, sparsel punctured. Elytra black, sparsely and moderately coarsely punctured, an sparsely pubescent. Body beneath and legs black. Length .20—.26 inch; 5—6.5 mm.

Male.—Elytra at tip black, neither smooth, elevated nor impressed.

Female.—Elytra resembling the male.

Resembles *collaris* from the Atlantic Region which, however, has the elytra of male at tip somewhat smoother and distinctly impressed.

Collected in California and presented by Mr. P. S. Sprague, of Boston.

C. Bardii, n. sp.—Head black, front sparsely, hind angles coarsely and densely punctured. Antennæ black, subserrate. Thorax rufous very sparsely punctate. Elytra black, with oblique, narrow, testaceous stripe from the humerus to the apex, surface coarsely and deeply and not densely punctured. Body beneath and legs black. Length .22 inch; 5.5 mm.

Male.—Tip of elytra testaceous, prolonged and turned slightly upward.

Female.—Elytra normal at tip.

Collected by Mr. Crotch, at San Buenaventura, California; dedicated to Mr. Thomas Bard, of that region.

C. distinguenda, n. sp.—Closely allied to the preceding species and agreeing with it in form and sculpture and and differs only in the elytra being entirely black (except at tip ♂) without oblique vitta. Length .22 inch; 5.5 mm.

Collected at San Buenaventura, California.

These two species, *Bardii* and *distinguenda*, differ from all the other species in having the elytra caudate in the male. The prolongation is acute and turned slightly upward and inward.

The species of *Corphyra* may be taken in considerable numbers, at times, on the flowers of various umbelliferous plants.

MYCTERUS, Clairv.

M. quadricollis, n. sp.—Black, elytra luteous or piceous. Head subopaque, densely punctured. Antennæ pale yellow. Thorax sub-quadrate, slightly broader than long, sides feebly arcuate, base scarcely broader, surface moderately convex, median line vaguely defined and a feeble oblique impression on each side near the middle. Elytra oblong wider at base than thorax, surface moderately coarsely punctured, punctures gradually finer to apex and with minute punctures in the intervals bearing short cinereous hairs. Body beneath black, opaque, densely punctulate and finely pubescent. Legs yellowish, hind femora piceous. Length .20—.22 inch; 5—5.5 mm.

Male.—First joint of antennæ moderately stout; second not longer than fourth, elongated conical; third gradually clavate, as long as the two following together; joints 4—10 irregularly quadrate, flattened, gradually shorter; joint 11 flattened pyriform. Last abdominal segment broadly rounded at tip,

slightly emarginate at middle and not concave, broadly margined with rufous.

***Female.*—Antennæ similar in form to the male but less flattened, joints longer than wide and more triangular..**

This species differs from the other *Mycterus* in our fauna by the broader antennæ of the male, the flat and emarginate last ventral segment, and the thorax not widest at base.

Specimens were collected by Mr. Crotch, at Temescal, California, on the flowers of Agave.

The last ventral segment, in the two other species of which the males are known, has the margin rather broadly reflexed so that there is a moderately deep semilunar depression formed, the posterior margin is rounded in *concolor* and broadly truncate in *scaber*. The first ventral segment at middle in the above two species is elevated in a moderately convex umbone, which in *scaber* is densely pubescent, and in *concolor* somewhat more convex, and in the only male before me entirely nude. The species just described does not appear to have this elevation of the first ventral segment.

———o———

Descriptions of New COLEOPTERA chiefly from the Pacific Slope of North America.

BY J. L. LECONTE, M. D.

The present paper is prompted by a desire to render the collections of Mr. G. R. Crotch, on the Pacific Slope of North America, available to the subscribers and purchasers of his collections with the least possible delay. On examining the large number of specimens brought back by him, as was to have been expected, many new species were found; descriptions of the more interesting of these have been prepared by Dr. Horn, Mr. Crotch and myself, according as our familiarity with the respective families represented by the new species has enabled us to do this with precision. I have availed myself of the present opportunity to add the characters of a few remarkable or important species, partly from the Pacific, partly from other regions of the United States, which have been added to my collection, by the kindness of various friends.

I trust that the anomalous characters and difficult position of some of the genera herein described will absolve me for departing, in this instance, from the generally established scientific usage of publishing in systematic or faunal memoirs.

TETRAGONODERUS Dej.

T. latipennis.—Depressed, greenish bronze, without lustre; porthorax nearly twice as wide as long, rounded and sinuate on the sides, the reflexed margin of which is pale, moderately narrowed behind, hind angles rectangular or nearly so, not at all rounded. Elytra nearly twice as wide as the prothorax, about one-third longer than wide, deeply emarginate at base, much rounded on the sides, obliquely and strongly truncate at tip; color pale, with small dark spots forming a small subapical band, and limiting also a rather broad irregular pale brown band behind the middle; there is also a broad basal spot extended a short distance along the suture; the striæ are fine, somewhat deeper towards the tip; the 2d and 3d are slightly sinuous before the middle; dorsal punctures two, near the 2d stria, the posterior one just behind the middle. Antennæ palpi and legs pale. Length 5.6 mm; .22 inch.

Texas; Mr. Belfrage. The elytral markings are of the same pattern as in *T. fasciatus* and *undulatus*, from which it abundantly differs by the other characters.

POGONUS Dej.

P. parallelus.—Elongate, parallel, not very convex, testaceous, shining; prothorax but little wider than head, a little wider than long, scarcely narrowed and very feebly subsinuate on the sides behind, base finely margined, slightly rounded near the hind angles which are rectangular, feebly carinate and not prominent; dorsal line fine, deeper towards the base, which is transversely impressed and foveate each side: elytra not wider than prothorax, very long and parallel, rounded and scarcely sinuate at the tip, striæ fine punctured, obliterated at the base, humeri with a short carina; marginal and submarginal striæ very deep, confluent at the anterior fifth of the length; dorsal punctures two, the anterior on 3d, the posterior on 2d stria. Long 5.5 mm; .22 inch.

Texas; one female. The mentum tooth is bicuspid, and the insect has otherwise all the characters of this genus. The basal fold of the elytra is nearly straight, and the humeral carina runs obliquely backwards from it.

P. depressus.—Elongate, strongly depressed, testaceous; head rather large, mandibles more prominent: prothorax not wider than long, widest in front, feebly rounded on the sides, gradually narrowed behind and subsinuate, hind angles rectangular, slightly prominent, finely carinate; dorsal line entire, deeper behind, transverse impressions well marked, the posterior one rugose; basal foveæ deep rugose: elytra at base wider than the base of the prothorax, basal fold strongly concave anteriorly, humeral carina forming part of the curve, striæ deep punctured, less distinct towards the base, marginal and submarginal striæ very deep, confluent at the anterior fifth, dorsal punctures three; scutellar stria distinct. Length 5.5—7 mm; .22—.28 inch.

San Diego, California; Mr. Ulke. A singular insect, quite different in form from all others of the genus, and suggestive of a flat elongate Bembidium of the *Peryphus* group.

The frontal striæ are long and deep, the eyes not very prominent, though convex; the 6th and 7th striæ of the elytra are shorter and, more obliterated in front than the others; the antennæ are pubescent, with the first two joints and half of the third shining and glabrous. In five specimens, kindly loaned to me, I observe no tarsal differences worthy of mention.

P. texanus Chaud., is very different in appearance from the two above described. It is a short, robust, convex species of metallic blackish-green color, with the hind angles of the prothorax rectangular but not carinate, and the base, each side, with two feeble foveæ. The striæ of the elytra are faint, only the inner ones being distinct, and they are distinctly punctured in front. finer and smoother behind; the marginal and submarginal striæ are confluent in front, but the latter is nearly obsolete except towards the tip, where it is deep. Body beneath blackish brown, legs testaceous. The general appearance is that of *Bradycellus nitidus*.

I owe my specimen of this rare insect to the liberality of Baron Chaudoir, who, although having but two specimens in his cabinet, has divided them with me in order to make one of them accessible to American students.

HYDROSCAPHA, n. g. (*Hydroscaphidæ.*)

Head moderately large, eyes lateral coarsely granulated somewhat transverse; antennæ scarcely longer than the head, inserted under the edge of the front, with seven distinct joints; 1st stouter, 2d and 3d each as long as the 1st, but narrower, 4—6 together shorter than 2d and 3d united, gradually wider, 7th about as long as the 2d and 3d united, elongate oval, scarcely wider than the 6th, with an indistinct transverse suture near the base, and another very near the tip, which is subacute.

Labrum transverse, rounded in front concealing the mandibles. Maxillæ large at the base (lobes not examined), maxillary palpi less than half as long as the antennæ, 1st and fourth joints long, 2d and 3d united equal to either of the others, not dilated; mentum trapezoidal, rather large, broader than long, wider in front; ligula rather large, emarginate, palpi short, rather stout, 2d and 3d joints broader and shorter than the 1st.

Prosternum very short, hardly visible, front coxæ transversely conical, contiguous, trochantin large, cavities narrowly closed behind; middle coxæ separated, small, mesosternum protuberant; metasternum large, side pieces narrower and pointed behind, hind coxæ widely separated, laminate, the plate curved in arc of circle behind, and half as long as the 1st ventral.

Abdomen conical with six free segments, 1st large, longer than the four following united, which are equal in length but rapidly narrower; 6th equal to the four preceding united, rather longer than wide, concave and emarginate behind, with two anal filaments equal in length to the segment itself.

Legs short, front tibiæ somewhat thickened at tip; tarsi slender, rather shorter than tibiæ, apparently 4-jointed, 1st and 2d joints short, 3d equal to them united, 4th equal to the others united, claws rather long and slender.

Body small, scaphiform, rounded in front, narrowed behind, convex, elongate and shining. Head rather large; prothorax narrower in front, with deflexed angles, base truncate not margined. Scutellum small. Elytra without striæ, slightly punctulate, broadly truncate at tip. Abdomen projecting somewhat behind the elytra, with three segments visible, conical, not margined at the sides.

H. natans.—Oval, narrower behind, convex, black or brown, shining; head and prothorax nearly smooth, elytra sparsely and finely punctulate; antennæ and legs testaceous. Length less than .5 mm; .02 inch.

Found abundantly by Mr. Crotch, at Los Angeles in the river. Mr. Crotch informs me that this very singular insect resembles, in appearance some of the species of *Limnebius*. It greatly differs from that genus, as from all other *Hydrophilidæ* by the laminate and widely separated hind coxæ, and by the peculiar abdomen. It seems to me another of the synthetic types gradually becoming known to us among the smaller and more obscure forms, connecting several different families of the *Clavicorn* series; in this instance the *Hydrophilidæ*, *Scaphidiidæ* and perhaps the *Trichopterygidæ*. In the accepted arrangement of Coleoptera, it must be considered as indicating a new family.

SEPIDULUM, n. g. (*Hydrophilidæ.*)

Body small ovate convex, without lustre, prothorax greatly produced in front over the head, divided by obtuse elevated lines into large cells; elytra costate, costæ separated by two distinct rows of quadrate punctures. Head flat, densely punctured, occiput convex and feebly channelled; labrum short transverse, feebly rounded in front, mandibles small, not prominent; eyes lateral, convex, partially divided by the canthus, not very finely granulated; palpi short, last joint nearly conical. Antennæ as long as the head, 9-jointed; 1st joint about two-fifths of the whole length, elongate triangular, outer edge subsinuate, inner edge angulated beyond the middle; 2d joint nearly as wide as the widest part of the 1st joint, rather wider than long, 3—5 smaller, nearly equal in length, but gradually a little narrower, 6th transverse, triangular, inner angle acute, 7th to 9th larger, forming a loose club, as long as the other joints (except the scape) united; the 8th joint is wider, and the 9th longer than the others, the latter obtusely rounded at tip. Prothorax produced over the head into an obtuse lobe; sides dilated and rounded in front, narrowed towards the base; disc uneven, with large impressions and obtusely elevated lines, the most conspicuous being a large medial rhomboidal impression, extending almost from tip to base. Elytra wider than prothorax, gradually wider behind, and obtusely rounded; suture, margin and three costæ elevated, separated by two rows of quadate punctures; between the outer costa and the margin is a large tubercle about one-third from the base; there is also a broad oblique transverse impression behind the base, which interrupts the 2d costa. Prosternum very short in front of the coxæ which are transverse and contiguous; middle and hind coxæ also contiguous; legs roughly and densely punctured; tibiæ moderately slender, feebly dilated, without spurs; tarsi short (hardly one-third the length of the tibiæ), apparently 4-jointed, claws small.

The abdomen is deeply withdrawn in the cavity of the elytra; it is flat, and I can see but four ventral segments, the last is rounded at tip, and vaguely impressed each side; there may, however, be five segments, the 1st being invisible on account of the prominence of the metasternum and the contraction of the abdomen.

The genus is named in allusion to the resemblance in form of the prothorax to that of *Sepidium*. The characters are altogether anomalous, but seem to resemble those of *Hydrophilidæ* rather than any other family, approaching more nearly perhaps to *Ochthebius*.

S. costatum.—Ovate convex, brown, opaque; prothorax produced in front over the head, dilated at the sides, narrowed behind, with several impressions and obtusely elevated lines, at the middle with a large elongate rhomboidal impression; elytra finely rugose, with suture, margin and three discoidal costæ elevated, an oblique discoidal impression behind the base, and a large tubercle near the side in front of the middle; interspaces with two rows of small quadrate punctures. Length 2 mm; .075 inch.

Texas; Mr. G. W. Belfrage. Though not found on the Pacific Slope of the continent, the characters are so extraordinary that I have included this species in the present paper as a proper companion to the other singular forms which are here described.

TRIGONURUS Muls.

T. Crotchii.—Dark chestnut-brown, shining, depressed, head and prothorax sparsely punctured, the latter one-half wider than long, narrowed and rounded on the sides in front of the middle, tip emarginate, base truncate, hind angles rectangular, disc feebly channelled with a large shallow coarsely punctured basal triangular impression each side; elytra twice as long as the prothorax, each with six deep strongly punctured striæ, the seventh is fainter, abbreviated in front about one-fifth from the base, and the eighth does not reach the middle; abdomen sparsely punctured. Length 4.5 mm.

Vancouver Island and Sierra of California; under pine bark. The characters of this genus, so peculiar as almost to warrant its establishment as a separate tribe, have been fully pointed out by Mr. Kraatz (Ins. Deutschl. ii., 805), and the question of its affinities need not be here discussed. In comparison with the figure of the European *T. Mellyi*, given by Duval (Gen. Col. Eur. ii., pl. 23, f. 113), this species differs conspicuously by the prothorax being transverse, and more rounded on the sides before the middle, the color is also less blackish and more testaceous, and the abdomen longer and narrower.

T. caelatus.—Brown, shining, depressed; head deeply punctured, transverse frontal impression strongly marked, neck smooth; prothorax coarsely and sparsely punctured, punctures more dense in the triangular shallow basal impressions, and more distant each side of the dorsal channel, which is deep, but does not extend to the base; behind it is a vague V-shaped impression, sometimes obsolete; elytra with close set rows of large punctures, which do not form grooves or striæ (as in the preceding species); abdomen strongly but not coarsely punctured. Length 18 inch; 4.5 mm.

Sierras of California, under pine bark; abundant. This species does not differ in size or form from the preceding, but is easily known by the much coarser sculpture. The prothorax is less transverse, being perhaps one-third wider than long, and more broadly rounded on the sides. It differs from *T. Mellyi* (according to the figure above cited), by the elytra not wider the prothorax, and by the longer abdomen.

ZALOBIUS, n. g. (*Oxytelini.*)

Body elongate depressed, opaque; head large, prolonged behind the eyes, suddenly and moderately constricted at base; mandibles slender, curved, acute, armed with a large acute tooth; labrum not emarginate; maxillary palpi very slender, last joint more than twice as long as the preceding; antennæ not geniculated, 11-jointed, 1st and 2d joints thicker, the 1st pyriform, the 2d globose; 3d one-half longer than the 4th, very slender, 4—6 equal in length, slender, 7—10 triangular, gradually slightly wider, 11th oval, somewhat obtusely pointed, not as large as the 10th; eyes small. Prothorax with narrow apex, very suddenly and strongly dilated on the sides, acutely angulated and subspinose, then rapidly narrowed with a concave outline, base broadly rounded, not wider than the tip; disc with two faint dorsal grooves, a broad anterior impression and one on each side, side margins distinctly reflexed; elytra quadrate, emarginate at base humeri rounded, tip squarely truncate, sides distinctly margined, with traces of longitudinal lines, abdomen broadly margined at the sides, gradually narrowed and pointed behind, less than twice as long, as the elytra; anal appendages short, with a short terminal bristle. Legs slender, tarsi rather short, 5-jointed, joints 1—4 gradually a little shorter, 5th longer than the two preceding united.

Z. spinicollis.—Depressed, dull black without lustre, densely confluently punctured; elytra with faint traces of longitudinal elevated lines; outer joints of antennæ, palpi and tarsi brownish. Length 5.6 mm.

Vancouver Island; in moss exposed to dripping water. The body is entirely without lustre, except on the abdomen, which is slightly shining and less densely punctured. I have not dissected this insect, so that the description of the mandibles indicates only what is seen beyond the labrum. It belongs to the group *Coprophili* of the *Oxytelini.*

TRICHONYX Chaudoir.

T. striatus.—Chestnut-brown, shining; head with the usual deep angulated impression, and two large foveæ between the eyes; prothorax with a fine dorsal groove dilated into a fovea near the tip, which it does not reach, crossed near the base by a deep transverse groove, which is dilated each side near the hind angle; sides much rounded in front, narrow behind the middle; elytra wider than the prothorax, not convex, sparsely punctured, with a very deep sub-sutural stria, two approximate discoidal striæ from base for three-quarters the length, and a short groove from the humerus; humeral plica elevated; abdomen smooth, narrowly margined. Length .08 inch; 2 mm.

Vancouver Island. The antennæ are stout, scarcely reaching the base of the prothorax, with the joints rounded, 1st and 2d thicker, 3d—8th nearly equal, 9th and 10th gradually a little larger and transverse, 11th large, oval, obtusely pointed.

TYCHUS Leach.

T. cognatus.—Dark brown, sparsely pubescent; elytra, feet and antennæ paler, the latter with joints 3—8 rounded, equal, ninth and tenth larger also rounded, 11th as long as the two preceding, oval, pointed; prothorax with a very small narrow fovea near the base, convex, a little longer than wide; elytra convex, with the discoidal stria extending about half the length. Length .06 inch; 1.5 mm.

Vancouver Island. Of the same size and form as the Californian *T. tenellus* Lec., but differs by the 9th and 10th joints of the antennæ being larger, about twice as wide as the 8th.

DERMESTES Linn.

D. signatus.—Elongate oval, convex, blackish-brown, clothed with brown pubescence, which is more dense from the base of the elytra backwards to behind the middle; near the base on each is a small dark angulated mark composed of three spots. Length .22—.32 inch; 5.6—8 mm.

Widely distributed in Northern and Western America; Hudson Bay Territory, Vancouver Island and California. Quite distinct from *D. lardarius* by the uniform brown color of the pubescence, and by the finer punctuation of the upper surface; the dense pubescence of the elytra sometimes extends nearly to the tip; in other specimens only a little behind the middle, but in all it is prolonged on the disc farther than at the suture and side.

TROGODERMA Latr.

T. Belfragei.—Elongate, subcylindrical, black, clothed with scattered grayish-white hairs; head and prothorax very densely, elytra less densely though rather closely punctured, with two narrow undulating bands of white and fulvous hair, the 1st about one-quarter from the base, the other one-quarter from the tip, base of antennæ, tibiæ and tarsi brown. Length .22 inch; 5.5 mm.

Texas; Mr. Belfrage, one specimen. Much more elongate than our other species. The club of the antennæ is perfoliate, composed of five joints, and is about as long as the preceding joints united.

KALISSUS, n. g. (*Micropeplidæ.*)

Body smooth, shining, sides of prothorax broadly flattened, elytra with two pairs of approximate striæ widely separated behind converging towards the base; abdomen conical not margined; mesosternum moderately wide, deeply excavated for reception of the prosternum; metasternum with an oblique impressed line (somewhat as in *Coccinella*), epimera large, visible as a triangular space at the sides behind.

This remarkable insect has the form and all the essential characters of *Micropeplidæ* (9-jointed antennæ with solid club, 3-jointed tarsi, widely separated hind coxæ, etc.), but differs remarkably by its sculpture; the elevated lines of the head, prothorax and abdomen are quite absent, and the costæ of the elytra are represented by only two pairs of impressed lines which converge towards the base, with interspaces becoming slightly elevated. The antennæ are longer and more slender than in *Micropeplus*.

The last ventral segment in the ♂ is longitudinally impressed, the middle and hind tibiæ are bent inwards near the tip.

K. nitidus.—Broadly oval, rounded in front, obliquely narrowed behind the elytra; head with a triangular impression on the vertex, connected with a transverse frontal line; prothorax strongly narrowed in front, twice as wide as long, rounded on the sides, bisinuate at base, hind angles not rounded, disc smooth, very convex, sides very broadly depressed, alutaceous; elytra with two pairs of lines converging towards the base, interspaces costiform at the base, but becoming flat behind; disc convex, apical margin depressed, humeri not rounded; abdomen with five exposed segments, smooth, conical, not margined, about two-thirds as long as the elytra. Length 1.5 mm.

Vancouver Island; Mr. Crotch. On pebbly margins of a small lake near Gold Stream, in July.

GEORYSSUS Latr.

G. californicus.—Dull black, prothorax finely channelled, a little longer than wide, anterior lobe separated by a more distinct transverse impression than in *G. pumilus* Lec., and more deeply rugose; elytra with rows of quadrate punctures which are narrower than the intervening spaces. Length .07 inch; 1.8 mm.

California; Dr. Horn. This species is mentioned in Mr. Crotch's Check List, from the collections of Dr. Horn and myself, but has not been described. It is quite distinct from *G. pumilus* by the smaller and more distant rows of punctures of the elytra. The last named species has an extensive range, being found in Kansas, Canada and Massachusetts.

THROSCINUS, n. g. (*Parnidæ.*)

Body elongate oval, obtuse at each end, clothed rather densely with short suberect pubescence. Head protected beneath by a large lobe of the prosternum; eyes oval, rather finely granulated, not hairy; antennæ inserted in front of the eyes, 11-jointed, slender, nearly as long as the prothorax; 1st and 2d joints stouter, not longer than the 3d and 4th united, which are slender, 5th a little wider and shorter, 6—10 a little wider, subtriangular, 11th oval, not longer. Palpi with the last joint oval, acute. Prothorax wider than long, gradually narrowed from the base forwards, transversely very convex in front, base bisinuate. Scutellum rather large, triangular. Elytra convex, not wider than the prothorax, punctures fine, not arranged in rows. The other characters present nothing worthy of record.

T. Crotchii.—Black with a bronze lustre, finely pubescent with short suberect gray hair, finely and sparsely punctulate. Length .10 inch: 2.5 mm.

A singular insect found by Mr. Crotch, at San Diego. Differs remarkably from *Lutrochus*, to which it is otherwise allied, by the longer and slender antennæ and elongate form of body. It bears a general resemblance to *Throscus*, in appearance.

ELMIS Latr.

E. divergens.—Elongate oval, dark green-bronzed, finely pubescent: prothorax one-half wider than long, gradually narrowed and rounded on the sides from the base, disc convex distinctly punctured, basal lines extending as far as the middle, slightly divergent outwards, base emarginate in front of the scutellum, not foveate; elytra elongate scarcely wider than the prothorax, nearly parrllel on the sides and strongly margined, disc convex, striæ composed of close set quadrate punctures, scarcely finer at the apex, interspaces obsoletely punctulate; tarsi brownish. Length .10 inches; 2.5 mm.

California; Mr. Crotch. Narrower than *E. ovalis*, with the sides of the elytra nearly straight; quite distinct from all other species I have seen by the basal lines of the prothorax diverging outwards.

E. corpulentus.—Ovate, convex, thinly and finely pubescent, greenish-black; prothorax somewhat wider than long, feebly channelled, scarcely punctulate, narrowed and rounded from the base, front angles deflexed and broadly impressed, basal lines extending to the middle, very deeply impressed, not divergent, base emarginate in front of the scutellum, not foveate. Elytra wider than prothorax, very convex behind, much rounded on the sides, striæ deep, punctured in front, finer and less punctured behind; interspaces feebly punctulate. Length .10 inch; 2.5 mm.

British Columbia; Mr. Crotch. In one specimen the elytra have a broad basal band and large apical spot yellow; the antennæ joints 1—8 and the legs are also testaceous.

E. seriatus.—Elongate oval, black with a greenish reflection; prothorax wider than long, distinctly punctured, narrowed, and feebly rounded from the base, basal lines extending to the middle, with a fovea near the anterior extremity of each, base with two small foveæ near the scutellar emargination. Elytra scarcely wider than the prothorax, nearly parallel on the sides, not very convex, striæ composed of oval rather distant punctures, interspaces obsoletely punctulate; a large indistinct subhumeral yellowish blotch extends to the sides but not to the suture, last joint of tarsi yellowish. Length .075 inch; 1.8 mm.

One specimen, California; Mr. Crotch. Narrower than *E. 4-maculatus* Horn, and quite different by the elytral striæ not impressed and more distantly punctured.

E. foveatus.—Elongate, black; prothorax longer than wide, feebly narrowed in front, subsinuate on the sides, discoidal lines entire sinuate, disc with a deep oblique impression, a broad transverse one and a large medial fovea; elytra with striæ composed of large approximate punctures, 4th and 6th interspaces feebly carinate, the former extending three-quarters the length of the elytra. Length .08 inch; 2 mm.

Two specimens without locality collected by Mr. Crotch. Allied to *E. pusillus* Lec., and *similis* Horn, but differs by the less strongly carinate elytra. It is also a larger and less elongate species with the medial fovea of the prothorax more distinct from the transverse impression.

E. vulneratus.—Rather stout, brownish-black, slightly pubescent; prothorax feebly punctulate, scarcely longer than wide, slightly narrower in front, broadly rounded on the sides, discoidal lines entire, posterior impressions nearly transverse, scarcely oblique, feebly separated at the middle, base bifoveate near the scutellum; transverse impression deep entire, disc in front convex; elytra at base wider than the prothorax, sides nearly straight, then obliquely narrowed and slightly prolonged at tip, striæ rather finely punctured, interspaces sparsely punctulate, 4th and 6th finely carinate; antennæ and legs dark testaceous. Length .08 inch; 2 mm.

Texas; Mr. Belfrage. One specimen. Not quite so stout as *E. ovalis*, but nearly so.

E. caesus.—Elongate, parallel, testaceous, shining, slightly pubescent; head somewhat darker, prothorax scarcely longer than wide, nearly smooth, sides finely crenate, nearly straight in front; rounded near the hind angles, discoidal lines not very deep, obliterated in front, transverse impression very deep, disc convex before and behind; elytra very little wider than the prothorax; striæ composed of large punctures, becoming smaller and obliterated towards the tip, 6th interspace scarcely carinate. Length .05 inch; 1.3 mm.

Texas; Mr. Belfrage. A very distinct species of uncommonly small size.

PACHYPLECTRUS, n. g. (*Hybosorini.*)

Body ovate, convex, sides and under surface setose with long erect hairs, above smooth and glabrous. Mandibles broad, outer edge sharp, not rounded but obtusely angulated, labrum short rounded in front. Antennæ with the 1st joint of the club completely surrounding the others; eyes not divided, mentum not emarginate; head with a broad sinuated transverse impression and a frontal tubercle; prothorax wider than long, narrower in front, nearly smooth, finely margined at tip, sides and base; elytra very convex, gradually a little wider than the prothorax, then obtusely rounded; smooth with a deep sutural stria and two marginal striæ which are abbreviated in front, the inner one being fainter and shorter. Legs very stout, front tibiæ three-toothed, not serrate; middle and hind tibiæ thick, with the transverse crest and apical margin well developed; spurs of middle tibiæ long, of the hind pair short, broad and obtuse, the outer one being the larger. Tarsi, front as long as the tibiæ, slender, joints 1—4 equal; middle shorter than the tibiæ, joints 1—4 decreasing a little in length; hind pair only half the length of the tibiæ, stouter, joints 1—4 slightly decreasing in length; claws slender, simple.

P. laevis.—Chestnut-brown, shining; head with a frontal tubercle and transverse broad impression; prothorax and elytra smooth, the latter with a deep sutural and two marginal striæ; margins of body, under surface and legs clothed with long erect hairs. Length .26 inch; 6.5 mm.

One specimen, Sta. Barbara, California; Mr. Crotch. Remarkably different from all the species of the tribe thus far described by the absence of the elytral rows of punctures.

PELIDNOTA M'Leay.

P. lugubris.—Black, with a feeble metallic tinge; prothorax sparsely punctured, more finely and densely towards the sides, which are rounded, narrowed in front of the middle, but only slightly so towards the base, angles rectangular, slightly prominent; elytra dull, finely alutaceous, with scarcely perceptible traces of distant rows of punctures. Length .7—.9 inch; 17.8—22.7 mm.

♂.—With the front tarsi thickened, the inner claw dilated at base, and the club of the antennæ longer.

Arizona; Mr. C. V. Riley; also in the collection of Mr. Ulke. Related to *P. Lucæ*, but quite different by the nearly black color, the more finely punctured prothorax, which is less rounded on the sides, and less narrowed towards the base, and finally by the rows of punctures on the elytra being almost obliterated. The head is alike in both species, densely punctured, with the clypeus narrowly margined, and at the tip subtruncate, a little more distinctly so in the present species.

CREMASTOCHILUS Knoch.

C. retractus.—Brownish-black, not shining; prothorax wider than long, coarsely punctured, narrowed in front, broadly rounded on the sides, foveate inside of the front angles, foveæ not extending to the apical margin, hind angles suddenly and strongly retracted, acute, surrounded by a deep groove; elytra flattened, with the usual sculpture of large shallow punctures, not closely placed. Length .44 inch; 11 mm.

Texas; Mr. Belfrage. One specimen. The mentum is deeply and broadly incised behind. This species is allied to *C. canaliculatus*, but the prothorax is more convex, the foveæ adjacent to the front angles do not extend to the apical margin and the hind angles are much retracted, so that the base is fully one-fourth narrower than the middle of the prothorax, as in *C. varidosus*, to which it in other respects has no resemblance.

C. crinitus.—Brownish-black, not shining, thinly clothed above with very long yellowish hairs; prothorax rather flat, very coarsely punctured, sides rounded, subsinuate towards the base, hind angles rather large, elevated, smooth, circumscribed by an impression, inside of the front angles is a fovea extending to the apical margin; elytra flattened, with the usual sculpture and traces of broad longitudinal grooves. Length .5 inch; 13 mm.

One specimen, Utah? The mentum is obtusely pointed behind, and not incised. This species is related to *C. Knochii*, but the larger hind angles of the prothorax, the more broadly rounded sides, which are distinctly crenate, the less convex disc, and above all the long hairs distinguish it at first sight. The legs are as in *C. Knochii.*

SCAPTOLENUS Lec.

S. estriatus.—Brown, pubescent, hairs on prothorax, base of elytra and breast longer; elytra rather finely and densely punctured, without any appearance of striæ. Length .53 inch; 13 mm.

One immature specimen from Texas. Very different from *S. Lecontei* Sallé (*femoralis* ‡ Lec.), by the elytra having no vestige of striæ; otherwise it resembles that species, but is smaller, with the prothorax broader and the 3d joint of the antennæ more than one-half as long as the 4th.

In the Mexican *S. femoralis* the elytra are striate, but the prothorax is still broader and much more rounded on the sides, and the 2d and 3d joints of the antennæ are nearly equal, together a little more than one-half as long as the 4th.

BRACHYPSECTRA, n. g. (*Rhipiceridæ.*)

Body elongate, rather flattened, shining, punctured and pubescent; elytra strongly margined, feebly striate; head moderate, front convex, and mouth inflexed; labrum small, mandibles not prominent, palpi small and slender; antennæ inserted in triangular excavations, not distant, 11-jointed, joints 1—4 subequal, 3d a little longer, 5—10 triangular, transverse forming a serrate elongate mass, 11th larger, appendiculate, eyes large, oval, finely granulate; prothorax transverse, trapezoidal, side margin distinct, hind angles acute subcarinate; prosternum broad, feebly rounded in front, distinctly prolonged behind

the coxæ, inflexed and received into the excavated mesosterum; front coxæ transverse, without distinct trochantin, side pieces of mesosternum extending to the coxæ, which are subquadrate, not prominent and separated by the narrow mesosternum; side pieces of metasternum rather wide, parallel; hind coxæ extending nearly to the side margin, narrow, feebly sulcate behind, coxal lamina almost obliterated; abdomen with five free and equal ventral segments; legs slender, spurs very small, tarsi as long as the tibiæ, slender, last joint without onychium, claws simple; epipleuræ narrow, extending to the apex; scutellum rather large, rounded behind.

A genus of difficult position, having a general resemblance to *Zenoa*, but somewhat broader, with the mouth more inflexed, and the mandibles smaller. It differs, moreover, from the other genera of the family to which I have referred it, by the absence of onychium, and by the trochantin of the front coxæ being indistinct. It also differs more essentially by the prosternum being prolonged behind the coxæ, into an inflexed point received into an excavation of the mesosternum. It cannot be referred elsewhere in the series, unless it be to the tribe *Eubriini* of *Dascyllidæ*, to the species of which it has no resemblance in appearance, nor in the more special characters.

B. fulva.—Yellowish-brown, shining; head punctured, feebly channelled, transversely impressed between the eyes; prothorax transverse, trapezoidal, punctured, feebly channelled, hind angles prolonged, acute, subcarinate; elytra slightly wider than the prothorax, strongly margined, punctured, feebly striate, obtusely rounded behind; beneath shining, finely punctured and pubescent. Length .20 inch; 5 mm.

Texas; Mr. Belfrage. No sexual differences observed.

ARAEOPUS, n. g. (*Dascyllidæ.*)

Body elongate, oval, convex, rather acute before and behind, finely punctured, densely clothed with prostrate hair. Head deflexed, moderate in size, front convex, with the transverse suture distinct, epistoma entirely corneous. Mouth rather prominent; labrum convex, broader than long, rounded and feebly emarginate in front. Mandibles curved, acute at tip, visible beyond the labrum. Antennæ inserted upon the front at the sides behind the base of the mandibles, but not under a prominence, 11-jointed, rather stout, extending a little beyond the base of the prothorax, subserrate; 1st joint stout, shorter than 3d; 2d globose, 3d subtriangular a little longer than the 4th; 4—10 equal in length; 11th a little longer; eyes rounded, finely granulated; maxillary palpi not dilated, last joint a little longer;

labial with last joint somewhat triangular; mentum large, trapezoidal. Prothorax wider than long, very much narrowed in front, rounded and overhanging the head at tip, rounded on the sides near the hind angles, which are acute; base bisinuate. Scutellum rounded, concave. Elytra a little wider at base than the prothorax, rounded at the base, slightly enlarged for two-thirds the length, then obliquely narrowed; side margin distinct, wider towards the tip; striæ faint, the sutural deep towards the base. Prosternum narrow, prolonged behind the coxæ, and received into the mesosternum, which is triangularly incised in front and rather narrow between the coxæ. Front coxæ transverse, prominent, with large trochantin; middle coxæ with narrow trochantin extending to side pieces; hind coxæ laminate, gradually dilated inwards. Abdomen with the 1st ventral shorter and the 5th longer than the others which are equal. Legs slender, tarsi not lobed, a little shorter than the tibiæ, joints 1—4 equal, 5th equal to the three preceding united, claws simple, onychium not visible.

Were it not that the front coxæ and insertion of the antennæ forbid, this insect would be referable to the *Eucnemidæ*, to which family it has much resemblance in appearance.

The affinities are of course with *Lichas* and *Stenocolus*. From both it differs by the more convex front, the less elongate and less serrate antennæ, the more prominent front coxæ, the less prolonged excavation of the mesosternum and the 1st ventral segment much shorter; it differs besides by the prothorax being produced over the head, and not margined at the sides. In *Lichas* moreover the onychium is conspicuous, and in *Stenocolus* there is a series of smooth oblique scars on each side of the ventral segments.

A. monachus.—Blackish-brown, densely clothed with short yellow-brown pubescence, very finely punctulate; prothorax with two round basal foveæ, between which the base is depressed; elytra faintly punctured in striæ, sutural stria deep for one-quarter the length from the base. Length .4 inch; 10 mm.

Oregon; Lord Walsingham. The basal foveæ of the prothorax are nearer together than to the sides.

DICRANOPSELAPHUS Guérin.

D. Edwardsii.—Broadly ovate, not very convex, finely pubescent, black; elytra testaceous with feeble grooves which are irregularly punctured, interspaces as wide as the grooves, nearly smooth; prothorax bisinuate at base, much wider than long, sides and tip rounded in the arc of a circle, margin concave, reflexed, transparent and white along the front as far as the middle; scutellum large, black; legs brownish testaceous; antennæ black, second joint very small. Length .22 inch; 3—4.3 mm.

♂.—With the 3d and following joints of the antennæ bearing a long process, which is basal in the 3d, medial in the 4th and 5th, but nearly apical in the others.

♀.—Larger and stouter, elytra nearly black, antennæ serrate.

Found abundantly by Mr. Crotch, at Santa Barbara, flying about bushes near a stream. Of thirty-three individuals before me thirty are males and only three females. The larva is subaquatic, and according to Mr. Crotch resembles in appearance those of *Psephenus* and *Helichus*. I have adopted the name affixed to the species by Mr. Crotch in honor of Mr. Henry Edwards, of San Francisco.

MICROPHOTUS Lec.

M. angustus.—Elongate, brown testaceous, elytra darker, roughly and densely punctured, elevated lines distinct, sides concave and broadly margined near the base; scutellum and prothorax pale, the former channelled, the latter rough longer than wide, truncate at base, rounded in a semiellipse on the sides and tip, disc broadly convex in front, margined very broadly at the sides, and more narrowly at the tip. Length .28—.4 inch; 7—10 mm.

♂.—Eyes very large, convex, approximate, palpi long; antennæ 9-jointed, 9th joint with a small subulate point at tip; elytra long, entire; last dorsal segment bisinuate at tip, last ventral produced into a long process at tip; genital segment with slender lobes.

♀.—Eyes small, distant, head narrow, palpi less elongate; antennæ 8-jointed with a small terminal subulate protuberance; elytra entirely wanting, the scutum of the mesothorax being an undivided plate; apical process of last ventral short.

Mariposa, Oregon; Dr. A. Thevenet. This species though much narrower in form, is similar in sculpture to *M. dilatatus* Lec., from Lower California. The female of the last named species is unknown, so that the discovery of that sex in the present instance is more importnat. The difference in the number of antennal joints is a remarkable and hitherto unknown character in the family.

MATHETEUS, n. g. (*Lampyridæ.*)

Body not convex, rather Lyciform, above confluently punctured, strongly margined. Head concealed under the prothorax, short and broad, eyes distant, convex, moderate in size, finely granulated; antennæ inserted just in front of the eyes, distant, 11-jointed, strongly pectinate, 1st joint triangular, hardly longer than wide, 2d shorter, as wide as long, 3d triangular, inner angle acute; 4—10 triangular, each with an internal process as long as the joint and arising about the middle, or beyond the middle; 11th joint flat, acutely sinuate near the tip, which is also acute. Front concave behind the antennæ, convex in front of them; labrum transverse, broadly rounded in front, distinctly separated from the front. Mandibles acute; palpi moderate, maxillary longer, last joint subtriangular obliquely rounded at tip. Prothorax transverse, lateral and apical margin very wide and reflexed, irregularly rounded, base broadly rounded, hind angles obtuse, rounded. Scutellum triangular, small, rounded behind. Elytra with rounded humeri, wider from the base for three-quarters the length, then broadly rounded, disc rather flat, with four narrow elevated lines, suddenly declivous near the humeri, side margin broad and reflexed; epipleuræ wide. Front coxæ conical contiguous; middle coxæ quadrate, not large, contiguous; hind coxæ narrow, transverse, contiguous. Legs slender, not compressed, trochanters on the inner side of the thighs, tarsi with the joints 1—4 gradually shorter, 3d and 4th slightly lobed beneath, not emarginate, 5th slender, claws feebly dilated near the base. Abdomen (♀) with seven ventral segments, 7th smaller, rounded at tip; last dorsal broadly rounded at tip; genital segment not prominent; no phosphorescent spots.

A singular genus, which must be placed probably near *Calyptocephalus*, but differing from it as from all *Lampyrini* by the widely distant antennæ, broader mouth and better developed labrum.

M. Theveneti.—Black, without any tinge of brown; prothorax and elytra dull orange, the former with two approximate smooth spots, occupying the disc, and separated by a narrow dorsal channel, margin punctured; elytra densely and roughly punctured, with four fine elevated lines, the third of which commences on the humerus which is very prominent. Length .45 inch; 11 mm.

One ♀ collected at Mariposa, Cal., by Dr. A. Thevenet, and kindly given me by his brother, Mr. J. Thevenet, of Paris.

PHENGODES Hoffm.

P. integripennis.—Ferruginous yellow, elytra blackish-brown, finely pubescent and scabrous, as long as the abdomen, rounded at tip, not dehiscent, sides with narrow reflexed margin. Length .65 inch; 11—16.5 mm.

California. I have seen several males of this species, which resembles in all characters, except the length of the elytra, our two Eastern species. The labrum is, however, more suddenly and deeply emarginate, and the seventh ventral is rather cleft than emarginate, with a short obtuse process at the base of the cleft.

MASTINOCERUS Solier.

M. texanus.—Testaceous, abdomen dusky except at tip, opaque pubescent; head as wide as the prothorax, finely and densely punctured; prothorax a little longer than wide, front angles rounded, hind angles rectangular, finely and densely punctured; elytra one-third as long as the abdomen, dehiscent, rounded at tip. Length .25 inch; 6 mm.

Texas; Mr. Belfrage. Female unknown. Varies of a blackish color with the occiput and tip of abdomen testaceous. After examining the type of *Mastinocerus*, in the Paris Museum, I see no reason for separating this as a distinct genus. In the Chilian type the last joint of the antennæ has been broken off, and the 10th joint, by want of sufficient care has been regarded as the last joint, which has been, therefore, absurdly described as bifurcated, a form which I am free to say that our present knowledge leads us to believe does not exist in *Coleoptera*. In the Texan species above described the antennæ are 11-jointed, the 1st joint as long as the 2d and 3d, which are simple, the joints 4—10 slightly increasing in length, each with two long basal hairy cylindrical processes, about three times as long as the joint itself; 11th joint simple, as long as the branches of the 10th joint; maxillary palpi nearly as long as the head, last joint large, moderately dilated with the palparium elliptical; eyes large, finely granulated. The seventh ventral segment is emarginated almost to the base; the last dorsal is subtruncate or broadly rounded, with two shallow longitudinal furrows.

SILIS Charp.

The following table will enable the species of this genus to be easily distinguished; 8 and 9 may be perhaps variations in color of one species.

A.—Base of prothorax broadly rounded, sides excavated into a deep round cavity near the base; both angles of the excavation acute; ante basal appendage acute, spiniform..1. **spinigera.**

B.—Base of prothorax lobed, excavation of hind angles partly basal, angles therefore not very distinct, though acute, anterior margin of excavation sinuate with two prominent rounded angles; ante-basal appendage acute, spiniform, directed obliquely backwards.

Basal excavations of prothorax moderate, (color black, disc of prothorax yellow)..2. **difficilis.**

Basal excavations of prothorax larger (elytra and prothorax pale).
3. **flavida.**

C.—Base of prothorax lobed, deeply foveate, inside of the hind angles, which are therefore more prominent and acute; incisure near the base moderately deep, with the anterior angle rounded; ante-basal process compressed, rounded at tip.

Basal impressions of prothorax very deep, hind angles strongly carinated (upper surface pale).

Incisure of hind angle deep, appendage straight ....4. **cava.**

Incisure of hind angles broad, appendage curved..................5. **pallida.**

Basal impressions of prothorax much smaller; hind angles feebly carinated; (black, prothorax more or less yellow).

Incisure of hind angles deep, appendage long.................. 6. **percomis.**
Incisure of hind angles shallow, appendage short............ 7. **vulnerata.**

D.—Base of prothorax not lobed, broadly reflexed, as usual; excavation entirely lateral, anterior angle of incisure nearly rectangular, hind angle long, acute, produced into a slender filament which is bent forwards.

Elytra and prothorax pale, the latter sometimes with a black vitta.
8. **lutea.**
Black, prothorax yellow, sometimes with a black dorsal vitta... 9. **filigera.**

S. spinigera.—Elongate, testaceous, head, antennæ, elytra towards the tip, and legs more or less dusky; prothorax smooth, shining, wider than long, convex, strongly margined, deeply excavated and emarginate each side near the base, angles before and behind the emargination acute; armed in addition with a slender sharp spine near the hind angles; elytra finely scabrous and pubescent; antennæ with the 2d joint small, 3d equal to the 4th. Length .28 inch; 7 mm.

One ♂ Oregon. The basal excavations of the prothorax are large, deep and rounded.

S. flavida.—Elongate, black, prothorax, elytra and feet yellow, the former nearly twice as wide as long, sides straight oblique, front margin broadly rounded, feebly reflexed, disc convex, hind margin blackish strongly depressed and reflexed, deeply foveate each side; hind angles very deeply incised, anterior process narrow acute; elytra dusky towards the tip and sides, finely not deeply punctured: tarsi and hind thighs dusky; antennæ black (♂) as long as the body, 2d joint small, 3d and following ones equal. Length 6 mm.

Two ♂, California, at Lake Tahoe. Similar in appearance to *S. pallida*, but quite different by the deep incisure of the hind angles of the prothorax; penultimate ventral segment, as usual, deeply and widely emarginate.

S. cava.—Elongate, pale testaceous, prothorax much wider than long, sides oblique, deeply emarginate near the base, angle in front of emargination well defined, obtuse, basal angle produced into a compressed process which is rounded at tip; disc strongly margined, deeply channelled, very deeply excavated at the base each side; elytra finely scabrous and pubescent; occiput blackish; antennæ and legs more or less dusky, the former slender with the 2d joint small, 3d equal to the 4th. Length .2 inch; 5 mm.

One ♂, Oregon. Smaller than *S. pallida* with the sides of the prothorax oblique not rounded and the basal foveæ much deeper.

S. vulnerata.—Less slender, black, prothorax strongly margined, broadly rounded on the sides, broadly excavated each side at the base, emargination not very deep, angle in front obtuse, basal angle obliquely carinate, process short and rounded; disc feebly channelled with a reddish-yellow round spot each side; elytra finely scabrous and pubescent; antennæ short, 2d joint small, 3d equal to the 4th. Length .25 inch; 6 mm.

One ♂, Oregon. Very distinct by the short obtuse process of the hind angle of the prothorax.*

S. lutea *Lec.*, Journ. Acad. Nat. Sc. 2d, v. 333; *pallens* ‖ Lec., Proc. Acad. Nat. Sc. Phila., v. 339.

This species which has been incorrectly placed as a synonym of *S. pallida* Mann, is smaller and different by the antennæ being stouter, and the process of the basal angle of the prothorax longer filiform and bent just as in *S. filigera.*

S. pallida Mann, differs essentially by the basal excavations of the prothorax being separated from the emargination by an elevated oblique line which runs to the hind angle so as to render it carinate; the angle in front of the emargination is obtuse and the process behind the emargination is very near but separate from the small hind angle, compressed, deflexed and curved; sides broadly rounded. The antennæ are slender.

S. filigera.—Elongate, black, prothorax bright yellow, shining, very convex, finely sparsely punctulate, strongly channelled, twice as wide as long, apical margin rounded, strongly reflexed, basal margin deeply excavated and strongly reflexed; hind angles incised, anterior process not truncate, hind process filiform, suddenly bent forward; elytra more strongly punctured; antennæ (♂) as long as the body, 2d joint small, 3d nearly as long as the 4th. Length 3.6 mm.

One ♂, Santa Barbara, California. Narrower than *S. percomis* and quite different by the prothoracic characters. A specimen from Vancouver which I refer to this species has the front and hind margins and dorsal spot of the prothorax black.

DITEMNUS Lec.

D. obtusus.—Robust, black, prothorax twice as wide as long, smooth, sides rounded and sinuate, red, margins blackish, strongly reflexed; elytra rather finely scabrous, punctured; antennæ feebly serrate, 2d joint short, 3d equal to the following. Length 4 mm.

♂.—Sides of the prothorax suddenly rounded, deeply incised near the base, anterior process obtuse with a small cusp projecting backwards, posterior process rounded at tip, base excavated each side, medial part forming a lobe more suddenly limited than in *D. bidentatus;* antennæ two-thirds as long as the body.

♀.—Sides of prothorax less suddenly rounded, subangulated and feebly sinuate near the base, which is not lobed, hind angles obtuse, rounded; antennæ one-half as long as the body.

Los Angeles and Saucelito, California. Larger and more robust than *D. bidentatus*, and remarkably different by the sides of the thorax being rounded and the anterior process obtuse.

TRICHODES Herbst.

T. bimaculatus.—Dark blue, pubescent with long, soft, erect yellow hair; prothorax convex, rugosely punctured with an indistinct dorsal line; elytra thickly but not deeply punctured with a few faint traces of striæ near the suture and a bright orange round spot about the middle near the side; antennæ black. Length .4 inch; 10 mm.

California and Oregon. This species has become quite frequent in collections within the last two years. It is quite distinct from *T. ornatus* by the prothorax more convex, less constricted in front, less narrow behind, punctured and not shining. It is in these respects more allied to *T. Nutalli* Kirby, and may perhaps be an extreme variation of this species. Until intermediate forms occur it will be better to distinguish it by a separate name.

LEBASIELLA Spin.

L. maculicollis.—Dark blue, clothed with erect black hairs; prothorax a little longer than wide, oval, convex, finely and sparsely punctured, shining, red with a large discoidal black spot reaching the tip but not the base; elytra coarsely and thickly punctured. Length .2 inch; 5 mm.

Mariposa, California; Dr. A. Thevenet. More clongate than *L. janthina* and quite distinct by the color of the prothorax which is longer and less punctured. The antennæ are testaceous with the last four joints black; the legs seem to be brown.

HEDOBIA Latr.

H. granosa.—Dark brown, clothed with coarse cinereous pubescence, becoming brownish at the middle of the prothorax, which is compressed and elevated at the middle near the base; elytra densely granulate-punctate with scattered distant, small, smooth granules; behind the middle there is on each elytron a small angulated spot with less dense pubescence; scutellum very densely pubescent. Length .17 inch; 4 mm.

California. The prothoracic elevation is suddenly declivous and almost perpendicular behind.

XESTOBIUM Motsch.

X. affine.—Elongate, blackish-brown, very densely and finely punctulate, clothed with yellowish-brown short pubescence, (which in well preserved specimens is probably uniform), disc of prothorax not channelled, sides not strongly flattened. Length .24 inch; 6 mm.

Vancouver and California. Resembles in form *X. tesselatum*, but quite different by the finer punctuation, the less broadly flattened sides of the prothorax, and by the pubescence being much finer and not arranged in tufts; the last three joints of the antennæ are only one-half longer and wider than the 8th joint, and the 2d—8th are much more slender than in *X. tesselatum*.

Another species of this genus was given me by Mr. E. P. Austin, which may be here added, in order to avoid multiplication of references.

X. squalidum.—Blackish-brown, very densely granulato-punctate, irregularly clothed with spots of yellowish-brown pubescence; prothorax not channelled, sides widely margined, last joints of antennæ as long as the 6—8 united, and about twice as wide as the 8th. Length .19 inch; 4.6 mm.

Providence, Rhode Island; two specimens. Much smaller than *X. tesselatum*, but similarly punctured and pubescent; the prothorax is, however, not at all channelled and the last joints of the antennæ are much larger.

VRILLETTA, n. g. (*Anobiini.*)

The front coxæ in this genus are contiguous and the prothorax excavated beneath for the reception of the head, and the antennæ 11-jointed, in repose received under the head, as in the other members of the group Xyletini (Lec. Proc. Acad Nat. Sc. Phila., 1865, 237); the mesosternum is not advanced between the middle coxæ, but is as in Xyletinus. It differs, however, conspicuously from that genus by the antennæ.

These organs have the 1st joint of moderate size somewhat dilated, about two and a half times longer than wide; 2d ovate, as long as wide; 3—8 triangular, broader and gradually transverse in ♂ forming an acutely serrate funiculus; 9—11 longer, flat, each as long as the three of the preceding ones. The elytra are striate as in Xyletinus, with a long scutellar, ten dorsal and two short lateral striæ occupying the post-humeral expansion of the elytra, which is as well marked as in Xyletinus; the tip is feebly truncate and broadly rounded.

V. Murrayi.—Elongate, cylindrical, black, covered with very fine short cinereous pubescence; prothorax ferruginous with a broad black apical band, side margin broadly reflexed, disc convex, base margined each side near the hind angles, which are rounded; elytra with fine impressed scarcely punctured striæ, each with a ferruginous spot in front of the middle. Length .32 inch; 8 mm.

One ♂, California, given me by Mr. A. Murray. The prothorax is finely punctured and the interspaces of the elytra nearly flat.

V. expansa.—Blackish-brown, elongate, cylindrical, covered with fine short sericeous pubescence; prothorax feebly channelled, with side margin very widely reflexed, extending upon the sides of the base, disc convex finely punctured; elytra with the striæ fine, but deeper and more distinctly punctured and more oblique towards the base, tip more broadly subtruncate and rounded. Length .25 inch; 6 mm.

California; Mr. Crotch.

V. convexa.—Blackish-brown, elongate cylindrical, covered with fine sericeous pubescence; prothorax more distinctly punctured, convex, side margin much narrower; elytra with the striæ deeper, distinctly punctured, more oblique towards the base, interspaces convex. Length .28 inch; 7 mm.

California; Mr. Ulke and Dr. Thevenet. Differs from the two preceding by the narrower side margin of the prothorax and more convex elytral interspaces. One specimen has the elytra testaceous with dusky sides; it is probably not quite mature.

EUCERATOCERUS, n. g. (*Ptilinini.*)

Body cylindrical, clothed with fine subsericeous pubescence, very finely punctulate, elytra with very indistinct fine striæ. Head rounded, not received into the prothorax beneath, eyes rather large, finely granulated, not very prominent; palpi rather long, as in *Ptilinus*, but a little stouter, last joint elongate oval; antennæ with the 1st joint nearly as long as the 3d, 2d small, 3d and following subequal, about three times as long as wide, each with an oblique basal process longer and as broad as the joint itself, except that of the 2d, which is shorter and broader. Legs slender, tarsi longer than the tibiæ, 1st and 2d joints long, 3d and 4th small, 5th as long as the two preceding, claws small, distant.

A singular genus, closely allied to *Ptilinus*, differing chiefly by the form of the antennæ, the larger and less prominent eyes, and the longer and more slender tarsi.

E. Hornii.—Cylindrical, elongate, dark piceous, clothed with fine gray pubescence producing a leaden lustre; elytra with very fine indistinct punctulate striæ; antennæ and legs a little less dark in color. Length .25 inch; 4 mm.

One specimen, Texas; Mr. Belfrage. The antennæ are more than half the length of the body, the 10th and 11th joints are unfortunately broken off.

It gives me great pleasure in the name of this very interesting addition to the fauna, to express my appreciation of the excellent labors of my friend, Dr. G. H. Horn, in investigating the Coleoptera of the United States.

POLYCAON Lap.

P. plicatus.—Black, shining, thinly clothed with long erect yellowish hairs; head large, very densely and finely granulato-punctate, granules becoming less dense behind; prothorax as wide as long, convex, finely punctured, slightly narrowed behind, sides nearly straight, disc transversely impressed and feebly channelled; elytra very coarsely and sparsely punctured, each with a series of short very deep oblique grooves midway between the suture and side margin, posterior declivity oblique, flat, smooth, strongly margined with an elevated rim, suture also elevated behind; abdomen ferruginous, densely pubescent; labrum fringed with bright fulvous hair. Length .48 inch; 12 mm.

One specimen, Texas; Mr. Belfrage. Very distinct by the peculiar sculpture of the elytra. The grooves extend about one-fourth the width of the elytra, and are wider than the interspaces between them, and very deep; they are from twelve to fifteen in number; the posterior declivity of the elytra is margined for almost its entire length, while in *P. excesus* the margin extends about one-half the length of the slope, forming only a semicircle with that of the opposite side.

P. obliquus.—Black, thinly clothed with long erect yellowish hairs; head large, granulate; prothorax densely punctured, convex, feebly channelled, slightly narrowed behind, sides straight, rounded near the tip; elytra coarsely punctured, posterior declivity strongly margined for two-thirds the length, and suture elevated behind. Length .45 inch; 11.5 mm.

One specimen, Texas; Mr. Belfrage. Allied to *P. exesus*, with the punctures of the elytra less coarse, not arranged in rows and with the margin of the posterior declivity much longer, forming about two-thirds of an ellipse; the punctures also become smaller towards the tip.

PHYMATODES Muls.

P. nitidus.—Black, very shining, sparsely punctured, thinly clothed with long erect hairs; elytra with two transverse ivory-white slightly elevated fasciæ; base of elytra, legs and antennæ more or less brown; joints 1—6 of the latter with flying hairs. Length .24 inch; 6 mm.

California. The eyes are deeply emarginate, though less so than in *P. decussatus*. This species differs remarkably from all others in our fauna by the highly polished surface and sparse punctuation.

HYBODERA Lec.

H. debilis.—Blackish, finely punctulate and clothed with fine prostrate pubescence with two patches of silvery lustre, one oblique near the base, the other transverse behind the middle; prothorax longer than wide, lateral and dorsal tubercles very feebly developed. Length .25 inch; 6 mm.

California. Smaller than *H. tuberculata* Lec. (New Spec., 191), and more slender, having the general proportions of *Gracilia pyg-*

maea; the thoracic tubercles are not prominent, the antennæ of the ♀ are as long as the body; of the ♂ a little longer.

Larger series of specimens will probably prove that this is only a badly developed form of the species above mentioned. For the present, however, it is more prudent to retain it as distinct.

XYLOTRECHUS Chevr.

X. planifrons.—Black, finely pubescent; the following parts clothed with bright yellow hair; front except a narrow stripe; slender occipital band, apical and basal margins of prothorax, scutellum, transverse sub-basal spot, transverse band in front of the middle, extending along the suture nearly to the scutellum; transverse band about one-third from the tip, and broad apical margin; beneath with lateral yellow spots on each thoracic segment; abdomen with broad bands of yellow hair; antennæ and legs brown; frontal carinæ obsolete. Longte 7.5—13 mm.

California. Very similar in appearance to *X. insignis* Lec., but smaller, with the sides of the prothorax moderately and regularly rounded, not constricted behind; the subbasal spot of the elytra is not oblique but placed transversely; the prothorax and anterior part of the elytra as usual is clothed with long erect hairs. What especially distinguishes this species is that the usual frontal carinæ are obsolete and represented by a scarcely perceptible and very small flat callus. The front is elongated and flat as in other *Xylotrechus*, or I should be disposed to refer the species to *Clytus;* the maculation of the elytra is not very unlike that observed in *C. marginicollis.* It also agrees with that species and differs from the *Xylotrechi*, in having the yellow hair confined to the scutellum and not extending to the elytra.

TOXOTUS Serv.

T. virgatus.—Slender, black, finely densely sericeous pubescent, lateral tubercles of prothorax large obtusely rounded, constrictions strongly marked; elytra with the pubescence transverse; testaceous, suture, discoidal stripe and side margin blackish, tip obliquely subtruncate; abdomen of the ♂ ferruginous. Length 13 mm.

Oregon, Vancouver and British Columbia. This species might be mistaken for a variety either of *vittiger* or *vestitus*, but on comparison with the latter, which it resembles in the hairs of the elytra lying transversely, the constrictions of the prothorax are deeper and the lateral tubercle more prominent; in comparison with the former, the head is less narrowed behind, the lateral tubercle of the prothorax is larger and more obtuse, and the pubescence of the elytra is different, the discoidal vitta is also narrower, confined to the upper plane of the elytra and the lateral space between it and the margin is ferruginous. The antennæ in ♂ are stout and as long as the body; in the ♀ more slender and a little more than half as long; the abdomen is ferruginous in the former, blackish with silvery pubescence in the latter, as in *T. vestitus.*

STRANGALIA Scrv.

S. delicata.—Elongate, black; elytra testaceous, shining, sparsely punctured, with the scutellar margin, and a short basal vitta blackish; tips dehiscent, rounded; abdomen and legs ferruginous, tarsi dusky. Length 10—12 mm.

California. The prothorax is more sinuate on the sides, and the hind angles less prolonged than in our other species; the form is as slender as in the male of any species and is scarcely less so in the ♀ than in the ♂. The antennæ have no sensitive spaces and the last ventral segment of the ♂ is not excavated but merely feebly impressed and broadly emarginate at tip. The antennæ are inserted on a level with the front margin of the eyes as in all our other species.

LEPTURA Linn.

L. rhodopus.—Elongate, black, thinly and finely pubescent, thorax densely not finely punctured, longer than wide, gradually narrowed in front, feebly rounded on the sides, hind angles small acute; elytra parallel, coarsely punctured, tip subtruncate; feet bright ferruginous. Length 6.5 mm.

California. Allied to *subargentata*, *rufibasis*, etc., but the prothorax is less finely punctured.

OBEREA Muls.

O. quadricallosa.—Leaden-black, clothed with fine cinereous pubescence; prothorax yellow with four elevated black tubercles, the outer ones being nearer the base, a little wider than long, sparsely but coarsely punctured, disc elevated at the middle near the base; elytra coarsely punctured, with two elevased lines, basal margin yellow extending a short distance along the suture and side margin, tip rounded; legs and abdomen yellow, 1st and 2d ventral segments each with a broad blackish band, tips of tarsi black. Length .65 inch; 11 mm.

♂.—With the last ventral segment broadly concave and emarginate; last dorsal segment projecting beyond the pygidium, which is not retuse, but truncate and subemarginate.

♀.—With the last ventral channelled and less concave; pygidium retuse and prominent just in front of the tip, closely applied to the last ventral.

Western part of California and Nevada. In one specimen three ventral segments are dark, leaving only the 4th and 5th yellow. The claws in this species are broadly appendiculate at base and the elytra are rounded at the tip as in *O. Schaumii*, to which it is closely allied. It differs, however, by the prothorax wider, more rounded on the sides, with the callosities more prominent and not marked with a large puncture as in that species; the 1st joint of the antennæ is also a little longer.

STEREOPALPUS Fertó.

S. pruinosus.—Dark lead-colored, clothed with fine cinereous pubescence; prothorax campanulate, very densely and finely punctulate, finely channelled, less convex than usual; elytra more finely punctured than in the other species; thighs frequently yellow, with the tips black. Length .28—.38 inch; 7—9.5 mm.

California, abundant; Mr. Crotch. Of the same form as the Eastern species, but with the prothorax less convex and the elytra more finely punctcred.

EURYGENUS Ferté.

Eu. campanulatus.—Black, with a gray metallic lustre, clothed with half erect pubescence; prothorax scarcely longer than wide, campanulate, deeply channelled, strongly constricted at tip, sides suddenly rounded before the middle, then narrowed and nearly parallel, base margined, disc less convex than usual, very densely punctulate, and with scattered large punctures; elytra strongly and thickly punctured, marked with round spots of cinereous pubescence; 2d joint of antennæ a little shorter than the 3d. Length .30 inch; 7.5 mm.

Vancouver; Messrs. Matthews, four specimens. Differs from *E. constrictus* by more robust form and the absence of very long scattered erect hairs, and from all other species by the prothorax being broader and more suddenly rounded in front of the middle. The 2d joint of the antennæ is also comparatively longer, being but little shorter than the 3d.

EUSTROPHUS Ill.

E. impressicollis.—Elongate oval, equally rounded at each end, not very convex, brown, thinly clothed with very fine cinereous pubescence; finely and very densely punctulate, prothorax wider than long, semicircularly rounded in front, feebly bisinuate and finely margined at base, with a basal impression each side, which is marked by a longitudinal line· antennæ scarcely reaching the base of the prothorax, joints 6—10 gradually but slightly wider. Length 6.5 mm.

Vancouver Istand. This species has a perfectly regular elongate elliptical form and is less convex than any other known to me. It is also easily distinguished by the longer basal impressions of the prothorax and by the last joint of the maxillary palpi being broader, and more obliquely truncate; the spurs of the hind tibiæ are comparatively a little smaller and the elytra are not striate.

BLAPSTINUS Latr.

B. latifrons. — Oval, rather elongate, moderately convex, dull black, densely punctured, finely pubescent; front wider before the eyes and distinctly angulated at the sides; prothorax a little wider than the elytra, twice as wide as long, narrower in front, much rounded on the sides, base sinuate towards the sides and broadly truncate at the middle; hind angles obtuse, well defined; disc broadly convex, sides widely depressed. Elytra a little narrower than prothorax, elongate, sides parallel, tip rounded, striæ fine, finely punctured, not deeply impressed, interspaces nearly flat. L. 9.7 mm.; .38 inch.

One specimen, Vancouver Island; Mr. Crotch. Near *B. sordidus*, but larger, narrower and distinct by the clypeus being angulated at the sides, the prothorax narrowed towards the base, and more strongly rounded on the sides, and by the interspaces of the elytra not alternately more convex.

ASCLERA Schmidt.

A. discolor.—Black, finely pubescent; mouth, prothorax and elytra dirty yellow: prothorax very finely punctulate, narrowed and constricted behind, disc with two very large excavations and a smaller one near the base; elytra densely and finely punctureb, with the usual 3 elevated lines, the inner one less distinct; dusky towards the tip; legs dusky, tip of thighs and base of tibiæ yellow. Length .27 inch; 7 mm.

California; Mr. Crotch, eight specimens. This species precisely resembles *A. excavata* and *nigra* Lec., differing only in color.

RHINA Kirby.

R. frontalis.—Black, shining; head sparsely coarsely punctured, beak straight, as long as the prothorax, coarsely and comewhat densely punctured, obsoletely sulcate and sparsely setose each side; frontal fovea distinct; eyes nearly contiguous beneath, but widely separated above; prothorax a little longer than wide, narrowed in front, and broadly rounded at the sides, apex tubularly constricted, disc coarsely but not densely punctured, base nearly straight, margined; elytra cylindrical with rounded humeri, sides parallel, apex rounded, striæ finely punctured, interspaces flat, with a few distant small punctures; prothorax with the flanks and under surface densely and coarsely punctured. trunk and abdomen sparsely punctured, front tibiæ with 5—6 small teeth on the inner edge. Length .32—.45 inch; 8—11 mm.

Mojave Desert, under bark of Yucca; Mr. Crotch. This species differs from the others by the eyes not extending on the upper surface of the head, so that the front is broad and convex. The appearance is that of a gigantic Cossonide. The pygidium is almost covered by the elytra, but projects a little as in *R. barbirostris*.

Further study may require this to be separated as a distinct genus.

CRYPHALUS Er. (*emend.*)

C. carinulatus.—Cylindrical, less elongate than usual, black or brown, thinly clothed with long erect hairs; prothorax one-third longer than wide, sides parallel, apex rounded, hind angles obtuse and rounded, disc rough in front, as usual with transverse rows of sharp granules, punctured behind, with a nearly smooth space each side; dorsal line smooth, narrow and slightly elevated; behind the roughened part is a broad shallow transverse impression; elytra with approximate rows of rather distant punctures, posterior declivity deeply sulcate next the suture, outer edge of declivity with three small denticles, between which and the suture are two larger and more prominent acute teeth; front tibiæ with 4—5 distant acute teeth. Length .08—.12 inch; 2—3 mm.

Lake Tahoe, Calaveras and Mojave region, California; Mr. Crotch: Vancouver Island; Mr. Matthews. This species is allied to *C. nitidulus*, but is larger and less elongate. It is easily distinguished by the dorsal line of the prothorax being feebly elevated, and therefore subcarinate, while in *nitidulus* and *atratulus* the line is broader and flat. The teeth of the posterior declivity of the elytra are more developed and placed in the same manner as in certain species of *Xyloborus*, but the club of the antennæ is not at all as in that genus; the transverse sutures are quite distinct and convex forwards, precisely as in *C. nitidulus*. In the black specimens the shank of the antennæ and the tarsi are brown.

C. puncticollis.—Cylindrical, black or brown; prothorax nearly one-half longer than wide, in front with transverse rows of acute granules, behind sparsely and strongly punctured; elytra with rows of rather close set punctures, rows not approximate; posterior declivity deeply and broadly sulcate, outer edge of declivity obtuse; denticles very small, scarcely perceptible. Length .05—.06 inch; 1.2—1.5 mm.

Calaveras, California; one specimen, Mr. Crotch; Texas; Mr. Belfrage. Also allied to *C. nitidulus*, but much smaller, with the elytral rows of punctures finer and more distant, and the denticles of the posterior declivity small and inconspicuous.

C. digestus.—Black, shining, thinly clothed with fine erect hair; prothorax one-third longer than wide, rounded in front, rough with acute tubercles and sparsely pubescent, disc behind strongly not densely punctured, with smooth median spaces, and a vague transverse impression behind the rough portion; elytra with somewhat irregular rows of moderate sized punctures, sutural grooves extending from the middle to the tip, posterior declivity convex, nearly smooth, with the suture elevated, and the furrow composed only of the sutural stria. Length .70 inch; 1.7 mm.

Mojave Desert; Mr. Crotch. Allied to *C. puberulus* Lec., but with the punctures of the elytra more distinctly arranged in rows; and the pubescence finer. Rubbed specimens may appear to resemble *atratulus* and *nitidulus*, but the elytral punctures are much smaller, the rows more approximate, and the groove of the posterior declivity much narrower.

XYLEBORUS Eichhoff.

X. vicinus.—Cylindrical, black or brown, antennæ and feet dark ferruginous; prothorax longer than wide, broadly rounded on the sides, gradually narrowed in front and rounded at tip, punctured behind, granulate and hairy in front; elytra with distinct rows of punctures, interspaces flat with single rows of more distant punctures, sparsely clothed with long erect hair; posterior declivity concave, edge of concavity with several small denticles and two large ones. Length .10 inch; 2.5 mm.

British Columbia; Mr. Crotch. Allied to *X. caelatus* Eichh., but the elytral punctures are smaller and more distant, and the interspaces wider and flat. The denticles of the posterior declivity are similarly arranged and the two largest are rather within than upon the margin of the declivity. The tibiæ are coarsely and irregularly serrate as in *caelucus*.

X. hamatus.—Black, rather robust, with a few erect hairs; prothorax scarcely longer than wide, nearly square, with the apex rounded as usual, disc punctured behind, with a narrow smooth dorsal space, punctures before the middle roughly and acutely granulate; elytra with rows of distant punctures, sutural groove deep, broader behind, and expanded into the very deep posterior excavation, which is smooth and sharply margined; near the upper part of the declivity on each side is a long spine bent downwards at the end, and near the tip is a small acute tooth. Length .12—.16 inch; 3—4 mm.

Mojave Desert, California; Mr. Crotch. I observe no sexual differences in the individuals before me. This species resembles *X. plagiatus* Lec., ♂ in the singular armature of the elytra, but is much larger and otherwise quite different.

Several species of Xyleborus are in Mr. Crotch's collection, but are too closely allied to those already described to be properly mentioned on the present occasion.

TOMICUS Latr.

T. latidens.—Cylindrical, brown, shining, clothed with long erect yellow hairs, prothorax more parallel on the sides than usual, not much longer than wide, more broadly rounded in front, hind angles rounded; disc sculptured as in *T. pini*, more strongly impressed each side near the middle; elytral striæ deep, closely punctured, interspaces each with a row of punctures; posterior declivity concave as usual, subsutural denticle small acute, next tooth broad, composed of the confluence of three cusps, of which the upper one is least developed and the middle one most prominent; following this is a long acute tooth, and then the usual apical acute margin. Length .12 inch, 3 mm.

California; Mr. Crotch. Smaller than *T. pini*, with a shorter prothorax and very different elytral sculpture and armature.

Descriptions of New Species of COLEOPTERA from the Pacific Coast of the United States.

BY G. R. CROTCH, M. A. CANTAB.

[The descriptions here published were the last prepared by Mr. Crotch, and were intended to make a companion paper to those by Dr. Horn and myself. Many species which he desired to describe, belonging to families to which he had given special attention, remain undetermined, the rapid progress of the pulmonary phthisis which caused his death, having rendered all scientific labor impossible. I have, by the kind permission of Mr. W. D. Crotch, retained a series of the unnamed forms, which will be investigated fully at a future time.—Lec.]

Omus sequoiarum, n. sp.—Closely allied to *O. californicus*, but rather longer and markedly broader and stouter; the labrum is produced in front, instead of being transverse or at most convex; the antennæ are clearly thicker and shorter; the thorax is broader and shorter and less constricted at the base, the sides are more rounded, the disc is much less wrinkled, without being as smooth as in *O. Audouini;* the elytra are also broader and more convex. L. 17.5 mm.

Very distinct by the form of the thorax, which is so broad that the side pieces are not visible from above, as is the case in the other species. Found at present only at Calaveras in the Sierra Nevada, originally by Mr. Edwards, and afterwards by myself, in June, 1873. I have seen in all 20 specimens precisely similar.

O. Edwardsii, n. sp.—Again allied to *O. californicus*, but longer, and a generally larger insect; the antennæ are much stouter (being in fact thicker than in any other species), the labrum is convex in front, head broad, superciliary ridge obsolete; thorax as broad in front as it is long, sides straight, oblique, much narrowed towards the base, disc feebly wrinkled as in *O. sequoiarum;* elytra with the sides more parallel and less ventricose. L. 17.5—18 mm.

This is a larger and stronger insect than the others, with thick antennæ, heavy femora and longer tarsi. All the known specimens (6 in number) come from Lake Tahoe where it was first found by Mr. Henry Edwards, and again by myself. I have great pleasure in dedicating this species to its original captor, who had already detected the distinctness both of this and the preceding species.

Hydroporus (Cœlambus) unguicularis, n. sp.—Elongate ovate, fulvous, breast and abdomen black; head finely punctulate with smooth spaces; thorax transverse, sides slightly rounded, punctulate, disc nearly smooth, with a small black central mark and a linear fovea, base and apex faintly black; elytra regularly elongate-ovate, closely and finely punctate throughout, each with the suture (very narrowly) and three lines black, almost entire, a fourth line is broadly interrupted in the middle and at the apex. ♂ anterior tarsi short, broad, 3d joint deeply bilobed, external claw thickened, internal reduced to half the ordinary size, so as to appear rudimentary. L. 5.5 mm.

British Columbia, one male. Resembles *H. parallelogrammus* of Europe.

Hydroporus (Cœlambus) masculinus, n. sp.—Somewhat obovate, pointed behind, pale fulvous, breast and abdomen black; head very finely punctulate; thorax short, transverse, sides straight, base margined with black, finely and rather closely punctulate; elytra thickly and finely punctulate, pale yellowish, with the suture and four narrow lines black (the first and third not quite reaching the base). ♂ anterior claws much elongate, deformed, subequal, the external one flattened. L. 4.75 mm.

Lake Labache; very distinct by the male characters; the 3d joint of the anterior tarsi is also feebly bilobed and the claw joint is large and hardly longer than broad.

Hydnobius Matthewsii, n. sp.—Rather elongate, parallel, convex, testaceous; antennæ rather short, stout, 7th joint nearly as long as 9th, club pale head finely punctulate; thorax broader than long, narrowed towards the front which is truncate, front angles rounded, sides rounded towards the base, hind angles evident, obtuse, surface rather thickly punctulate, with a transverse punctate basal impression terminating in a fovea on either side; scutellum strongly punctate; elytra punctate-striate, sutural stria more deeply impressed, intervals punctulate and confusedly rugulose; body beneath smooth, femora deeply punctate. L. 4—6½ mm.

Flying at dusk near Gold Stream, Vancouver Island. The Messrs. Matthews took three or four fine male specimens of this species, which deepens in color to piceous-brown, and the punctuation varies in intensity.

Anisotoma paludicola, n. sp.—Regularly ovate, dark chestnut-brown, antennæ long, club lax, head scarcely punctulate; thorax convex, posterior angles obtusely rounded, surface shining, clearly and rather closely punctate; elytra also rather closely punctulate throughout, and feebly transversely rugulose, a sutural row of punctures tolerably marked. L. 3½ mm.

Sweeping at dusk in the marshes on El Cajon Ranch, near San Diego. Allied to *A. morulus*, but distinct by the more strongly punctate thorax and the irregularly punctate elytra.

Prostomis americanus, n. sp.—Elongate, flat, testaceous-red, parallel; head and thorax rather obsoletely punctate, the latter longer than broad, with a median line; elytra punctate-striate, intervals smooth. L 5½ mm.

Flying at dusk near Gold Stream, Vancouver Island, at the end of July. It is extremely close to the European *P. mandibularis*, from which it only differs by the longer 3d joint and the more oval terminal joint of the antennæ, the more rounded sides to the thorax and the shape of the jugular processes, which are very much less curved inwards towards each other in the American species.

Lasconotus? linearis, n. sp.—Elongate linear, not very convex, pitchy brown, clothed with a tolerably dense golden pubescence; head broad, scabrous; thorax longer than broad, front angles acute, sides crenulate, straight, narrowed slightly towards the base, disc scabrous, with two shallow foveæ towards the base, which is strongly margined; elytra each with five slightly raised lines, intervals with two rows of rather deep punctures, base and subapical spot rufous; body beneath opaque, punctate. L. 2.7 mm.

Under bark of Sycamore or some small forest tree at the Hot Springs in the Sta Inez Mountains. The little genus *Ozognathus* was excessively common in the same bark. This species agrees with *Lasconotus* in the 3-jointed club, but has the sculpture and appearance of *Synchytodes* [*Ditoma*]; it should probably form a separate genus, which may be compared with *Illestus* Pascoe.

Oxylæmus californicus, n. sp.—Elongate, cylindrical, dark red, finely pubescent; head punctate; thorax elongate, very coarsely punctate, with a smooth medial line and well marked basal impression near the hind angles; elytra punctate-striate, interstices smooth; prosternal epipleuræ rugulose, ventral segments coarsely punctate. L. 3.5 mm.

Calaveras, Sierra Nevada.

Trogosita yuccæ, n. sp.—Elongate, dark pitchy brown, legs paler; head finely subrugulose, sparingly punctate, a short impressed frontal medial line, anterior edge deeply tridentate; thorax about as long as broad in front, sides almost straight at first, then rapidly obliquely narrowed towards the base, sides and base strongly margined, hind angles very obtuse, sculpture as on head; scutellum transverse, very small, elytra margined at base, with rows of impressed punctures, intervals flat, also with rows of finer punctures, at the apex a small sutural stria is indicated; beneath brownish, prosternum with a few deeply impressed punctures. ♂ mentum with a fulvous tuft of hairs. L. 19 mm.

Under bark of the tree Yuccas on the Mojave desert in May. Apart from the color it may be noticed that the eyes are more strongly granulated than in *T. virescens*.

Differs from *T. barbata* by much more sparse punctuation of head and thorax and very weak punctures on the elytra.

Colastus yuccæ, n. sp.—Broad, depressed, opaque, black, pubescent, closely subrugulosely punctate throughout; thorax broader than long, feebly emarginate in front, front angles rounded, sides and base margined, the former broadly rounded, as are also the hind angles, base feebly sinuate in front of the scutellum; elytra with the sides acutely margined; pygidium sculptured as the rest of the upper surface. L. 5 mm.

Abundant in the unopened flower heads of Yucca in the Mojave desert.

Colastus agavensis, n. sp.—Subdepressed, shining, with a faint golden pubescence, color varying from brown to fulvous, head punctulate, with a transverse line between the antennæ; thorax transverse, not emarginate in front, angles deflexed, rounded, sides and base margined, the former rounded as are also the hind angles, disc dark brown clearly punctulate; scutellum large, punctate; elytra hardly margined, dark fulvous, rather closely and even subrugulosely punctulate; pygidium closely punctulate; prosternum smooth, ventral segments thickly punctate. ♂ with an additional dorsal segment. L. 4 mm.

Found at Fort Tejon in the flowers of the Agave.

EPURAEA Er.

E. Hornii, n. sp.—Broadly ovate, subdepressed, entirely fulvous, hardly shining, pubescence yellow; antennæ with the club yellow, last joint narrower than 10th; thorax broader than long, narrowed in front, greatest breadth behind the middle, sides rounded, posterior angles slightly produced, acute, sides explanate, margin reflexed, not thickly punctulate; scutellum punctate; elytra broader than thorax, sides rounded, explanate, punctuation subrugulose, apex obliquely punctate. ♂ intermediate tibiæ simple. L. 4—4.5 mm.

Canada; (Horn.) This is the largest and broadest *Epuræa* known to me.

E. (Dadopora) texana, n. sp.—Suboblong, not convex, entirely of a rich fulvous and clothed with golden hairs; antennæ with the 11th joint smaller than the 10th; thorax slightly transverse, very little emarginate in front, sides only slightly rounded, margins reflexed, but not explanate, hind angles right angles, sparsely punctate; elytra rather sparsely punctate, truncate behind, angles rounded; beneath finely punctate. ♀ intermediate tibiæ simple, posterior dilated, constricted at the base. L. 2.5 mm.

Texas; (Leconte.) This belongs to the same section as the *E.* 10-*guttata*, of Europe. *E. helvola* Er., is very distinct by the distant posterior coxæ and should form a new subgenus, which may be called *Epuræanella.*

E.? monogama, n. sp.—Deep brown, margin and legs rufous, somewhat shining, parallel, subconvex; upper surface closely and visibly punctate, punctures subrugulose in some lights, or possibly very faintly pubescent; thorax deeply emarginate in front, sides broadly margined, hind angles largely explanate, prominent, subacute, base not margined, sinuate behind the angles; scutellum triangular, punctate; elytra with the sides broadly flattened, apex subtruncate; beneath closely punctate, thoracic epipleuræ rugose. ♂ with an additional dorsal segment. L. 5 mm.

Found in Vancouver and throughout the Sierra Nevada in the small white globular fungus which occurs on dead pines. This will be found to have a hole underneath, and if carefully detached a pair of the above insects will gennerally be found, unless a marauding *Trogosita* has taken possession.

PTOMAPHAGUS Ill.

P. leptinoides, n. sp.—Broad, depressed, shining, rather pointed behind, bright fulvous sparsely pubescent; head and thorax sparingly punctate, shining; elytra subrugulosely punctate, epipleuræ scabrous; ventral segments finely punctate; antennæ with the joints elongate, 2 = 3, 8 smallest of all and narrower than 7 or 9. ♂ anterior tarsi with three joints dilated. L. 3 mm.

Fort Crook; (Horn).

This remarkable species has a strong external resemblance to *Leptinus*, the head being small so that the thorax is largely rounded on the sides, the posterior angles are produced but rounded.

GRYNOCHARIS Thoms.

G. pilosula, n. sp.—Brown, oblong, subconvex, thickly clothed with a sericeous pale decumbent pubescence, mixed with sparse erect hairs arranged in rows; thorax transverse, sides rounded, crenulate, broadly explanate, front angles rounded, shining, sparsely punctulate; elytra shining, rather less strongly pubescent, deeply and pretty closely punctate, sides explanate in the basal third; beneath pubescent, body dark. L. 4.5—5 mm.

Oregon and Vancouver. Entirely unlike *G. oblonga* by the pubescent, punctate surface, but agreeing generically with it.

SCYMNUS Kug.

S. pacificus, n. sp.—Oval, shining, sparsely pubescent, punctate; thorax transverse, margined at base; elytra each with a large yellow discoidal spot before the middle; body beneath punctate, tibiæ and tarsi red. ♂ front angles of thorax testaceous. L. 2 mm.

Calaveras, also in North California, at Lake Port, on oak trees. The metacoxal lines are complete and reach the edge of the first ventral segment.

S. coniferarum, n. sp.—Oval, pubescent, black beneath; thorax black, front angles red, lightly punctulate, base margined; elytra fulvous-red, base and a subscutellar triangular patch black, visibly punctate. L. 1.5 mm.

Calaveras, Taho, San Barnardino. on pine trees. The metacoxal lines are semicircular, complete, reaching two-thirds the segment. This species is less rounded than its allies

S. Phelpsii, n. sp.—Broadly rounded, convex, reddish-testaceous, clothed with a golden pubescence; thorax punctulate, base margined; elytra more visibly but not coarsely punctate, unicolorous; body beneath closely almost rugosely punctate throughout, legs pale, metasternum darker, almost black. L. 2 mm.

Victoria and New Westminster, by beating small shrubs in July. The metacoxal lines do not reach the edge of the segment and are incomplete externally.

CHAULIOGNATHUS Hentz.

Legs red at the base.
Sides of thorax straight, opaque.......................................**marginata.**
Sides of thorax rounded.
Thorax elongate, shining, elytra pale.......................................**discus.**
Elytra with apex black head red.......................................**profundus.**
Elytra with a subapical vitta black.......................................**opacus.**
Legs entirely black, elytra visibly punctate.
Thorax shining.
Elytra with the scutellar region and apical third black...............**basalis.**
Elytra with a small basal spot and posterior vitta black...........**Lewisii.**
Thorax with disc opaque.
Elytra with subapical vitta black.
Elytra with no basal spot, thorax subquadrate......**pennsylvanicus.**
Elytra with scutellar spot black, thorax elongate.............**scutellaris.**
Elytra with apical third black.......................................**limbicollis.**

C. Lewisii, n. sp.—Orange-yellow, subpubescent, head, legs and antennæ black; thorax subquadrate, sides and angles rounded, disc black, with a narrow yellow margin, shining, posterior foveæ tolerably deep; scutellum black, shining; elytra slightly shining, distinctly granulate, or rugosely punctate, each with a small basal patch (not reaching the shoulder) black; also each with a long black vitta, starting from the basal third and narrowly edged with yellow; body beneath with the coxæ, metasternum and two spots on segments to six black. L. 10 mm.

New Mexico. (Lewis.)

Zeugophora californica, n. sp.—Bright orange, metasternum, body and disc of elytra black; head shining, sparsely punctate, antennæ long; thorax longer than broad, coarsely punctate, lateral tooth obtuse, sides quite straight in the posterior third; elytra very strongly punctate, orange, with a common black sutural band reaching three-quarters the length. L. 3.5 mm.

On willows at Crystal Springs, Oregon; rarely.

Cryptocephalus nigerrimus, n. sp.—Entirely black, shining; thorax convex, scarcely visibly punctulate; elytra clearly punctate striate, intervals smooth, the two first striæ do not reach the apex; prosternal epipleuræ smooth, ventral segments rugulose, pygidium shining, sparsely punctate. L. 4 mm.

Crystal Springs, San Mateo. Easily known by the shining black color throughout.

Pachybrachys Donneri, n. sp.—Black, rather densely clothed with a short decumbent gray pubescence; head closely and thickly punctate, with a frontal impression; thorax broader than long, front angles well defined, sides rounded, narrowed towards the base, which is margined and produced into a rounded lobe before the scutellum; the sides are more or less yellow, the punctures remaining black; scutellum pubescent, truncate; elytra closely and irregularly punctate, the base and one-third the external margin narrowly yellow; pygidium uniformly punctate and pubescent, sides narrowly yellow:

prosternal epipleuræ deeply punctate, ventral segments closely and finely punctulate and pubescent. L. 3—4.5 mm.

On willows at the eastern end of Donner Lake, not rare.

Pachybrachys circumcinctus, n. sp.—Black, pubescent beneath femora and thorax red, elytra margined with yellow; head thickly punctate, black varied with yellow; thorax transverse, sparsely rather coarsely punctate, red, margined narrowly with yellow, sides but little rounded, base depressed and strongly lobed in the middle, lobe yellow, base on either side narrowly black: scutellum black, smooth strongly inclined; elytra yellow, each with a broad black thickly punctured vitta reaching nearly to the apex, the yellow parts sparsely punctate, punctures black, the extreme margin and suture narrowly black; pygidium finely punctulate, pubescent, black and yellow; prosternal epipleuræ deeply punctate, ventral segments pubescent, the last partly yellow. L. 4.5—5 mm.

Crystal Springs, Oregon.

Glyptoscelis varicolor, n. sp.—Allied to *G. cuprascens*, but much more closely punctate and more pubescent; color varying from green to blue or coppery; head punctate, eyes rather prominent; thorax slightly transverse, sides margined, rounded, suddenly narrowed towards the base, lobed behind the eyes, disc closely punctate and pubescent; scutellum quadrate; elytra closely and irregularly punctate, pubescent, callus well marked, feebly margined; prothoracic epipleuræ deeply punctate, under surface generally punctate and pubescent, antennæ pale at the base. L. 3 mm.

Found at Fort Tejon, San Bernardino and Santa Barbara.

SCELOLYPERUS g. n.

Agrees in all respects with *Luperus*, but the hind tibiæ are deeply arcuate and furnished in their basal third with a strong triangular tooth. I have only seen one specimen and do not know if the character is sexual.

S. tejonicus, n. sp.—Body beneath and legs black, head and elytra steel blue, base of antennæ and thorax dark yellow; head smooth with a strong carina between the antennæ; thorax rather broader than long, apparently impunctate, sides rounded in front, narrowed towards the base; scutellum black, impunctate; elytra steel-blue, rather coarsely and sparsely punctate. L. 5 mm.

The only specimen before me is much broken and was taken at Fort Tejon about the end of May.

THRICOLEMA, g. n.

Elongate, nearly parallel, pubescent, eyes small, head not constricted behind, anterior coxæ contiguous, 1st joint of the four anterior tarsi longer than the others, claws simple, epipleuræ of elytra excessively feeble. I am unable to put this genus satisfactorily into any of the tribes of *Phytophaga*.

T. anomala, n. sp.—Elongate, reddish-brown, with a rather long gray pubescence; head deflexed, closely punctate, a smooth line between the antennæ; thorax broader than long, more sparsely punctate, front angles forming a small tubercle, sides subangulate in the middle; scutellum elongate, thickly pubescent; elytra closely punctate, pubescent, humeral angles well marked, apices rounded; beneath pubescent, finely punctate. ♂ 5th segment with a deep semicircular emargination. L. 8 mm.

Calaveras.

Luperus graptoderoides, n. sp.—Rather elongate, parallel, bright bluish-green, base of antennæ slightly paler, 2d joint shorter than the 3d; vertex smooth, separated by a strong transverse impression from the front, which has a well marked longitudinal carina; thorax quadrate, sparsely punctuate, sides margined, straight; scutellum large, black; elytra thickly punctulate, finely margined; body beneath smooth. ♂ last ventral segment broadly foveolate, truncate at apex. L. 7 mm.

Santa Barbara, Santa Bueneventura, by sweeping. Much larger than *L. smaragdinus*, and distinct by the punctuation and large black scutellum.

Orchestris ramosa, n. sp.—Ovate, feebly bronzed above, closely punctulate, antennæ pale red at base: frontal carina well defined, vertex punctulate; thorax broader than long, closely and rather strongly punctulate throughout, sides rounded; elytra finely margined, no humeral angles, closely punctulate, with a clear yellowish discoidal vitta on each, this vitta is rather dilated at the base and gives off an external branch immediately below the callus, in the middle it is linear but is abruptly thickened and recurved at the apex. L. 2 mm.

Lake Port, North California.

Crepidodera basalis, n. sp.—Greenish bronze, legs and antennæ reddish brown, very sparingly pubescent, form oblong, rather stout; vertex smooth, front divided into three smooth triangles between the antennæ, which are long and infuscate at tip; thorax subtransverse, sparsely rather coarsely punctate, front angles not prominent, sides hardly rounded, finely serrate, base with a broad smooth impression, limited by a rather long well defined fold (the impression is roughened at the extreme end); scutellum large, smooth; elytra irregularly punctate; posterior tibiæ setose. L. 3 mm.

San Diego, devastating a blue flowering shrub in the canons round there.

Odontota Hardyi, n. sp.—Black, legs, thorax and elytra yellowish-red, the latter variegated with blackish; antennæ short abruptly elevate, seven joints free with a compressed annulate club of one joint; thorax subtransverse, very coarsely punctate, sides rounded and margined; scutellum small, black, transverse; elytra with a scutellar stria of 2, 3 dots, and with five pairs of rows of punctures separated by costæ, the 3d and 4th pairs confused at the base, edge of elytra serrate; under surface entirely black. L. 2½ mm.

Calaveras and Santa Barbara. Also taken by Mr. Hardy.

Note on the genus PLEOCOMA Lec.

BY JOHN L. LECONTE, M. D.

Some years ago I received from my excellent and liberal friend, Mr. Andrew Murray, of London, a female of this singular genus. I was unwilling at the time to describe it, as both antennæ were gone, and the specimen otherwise much mutilated. I saw a similar one in the collection of Dr. Candèze, at Liege, and recently Mr. Behrens, of San Francisco, has loaned me a more perfect individual, belonging to a different species.

The genus was founded by me * upon a mutilated specimen, which, however, retained enough of the antennæ to show that they were 11-jointed, with the 6th joint wider than preceding, the 7th still wider, and the 8—11 forming an elongate lamellate club.

Just before leaving the country, in 1857, on a long journey, I received perfect specimens of what seemed, on hasty examination, to be the same species, and I had barely time to pen a note to be appended to the Pacific R. R. Report, which was printed during my absence; calling attention, however, to the important difference in the antennæ, which in these new specimens, had the 4th joint prolonged inwards, joints 5—11 forming a 7-leaved club. † I also indicated the differences in the prothorax, finely and sparsely punctured in the 4-leaved specimen, quite densely punctured in the two with seven leaves.

No other specimens in the mean while occurred, and I was still unwilling in my classification of Coleoptera,‡ to indicate these two forms as distinct species. The condition of the type such as to render its study very unsatisfactory, and the observations were therefore made upon the perfect individuals of the second species.

In 1870, Dr. M. Schaufuss, (Nunquam otiosus, vol. ii.) after reciting the same history I have given above, describes at length a form with 7-leaved antennal club. The name under which he makes it known is inadmissible, and it must therefore be regarded as unpub-

---

* Proc. Acad. Nat. Sc. Phila., 1856, 24.

† Expl. and Surveys U. S. P. R. R., 47th Parallel, insects, p. 40, pl. 1, f. 13, *a*.

‡ May, 1861, p. 128; by a typographical or clerical error the last '5 or 6' joints of the antennæ are said to be lamellated, it should be '4 or 7'.

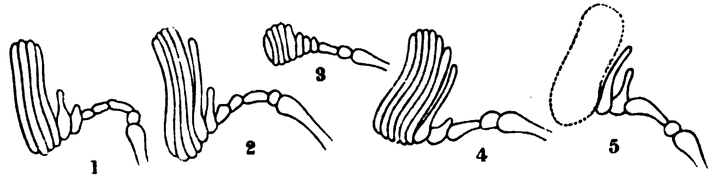
lished. In the same paper he describes another species *P. hirticollis*, in which the antennæ are 8-leaved, but the 4th joint, which is only slightly prolonged is counted in the club. This species seems to be the second form mentioned by me, of which I figured the antenna.

The females are much larger than the ♂, very ovate and convex, without wings, with the legs stouter and the tarsi short, only one-third as long as the tibiæ. The prolongation at the front of the head is short and broad, not emarginate, the vertical horn short, the prothorax coarsely punctured, not impressed, and finally the antennæ very much smaller, with the club rounded.

Just as this paper was being put to press, I received from Mr. Behrens a larva found deep in the earth. The description of it, by Baron Osten Sacken, will follow this note. I will merely observe, that its characters fully confirm the propriety of placing the genus as a distinct tribe, near *Trox* and *Geotrupes*, as I have done in my Classification.

The four species known to me may be divided into two groups according to the form of the antennæ, and the differences expressed in in the following table:—

I. Antennæ with joints 3—5 nearly equal, not dilated.
  6th joint scarcely wider than the 5th; 7th prolonged into a short leaf, one-fourth as long as the 8—11..1. **fimbriata.**
  6th prolonged inwards forming a leaf one-half as long as the 7th, which is shorter than the 8—11.......... ....2. **Behrensii.**
II. Antennæ with 3d joint elongated, 4th acutely produced inwards, 5th lamelliform, though shorter than the following ones.
  Hind angles of prothorax feebly rounded, disc clothed with long hair, elytra feebly striate.. ....3. **hirticollis.**
  Hind angles of prothorax strongly rounded, disc strongly retuse, elytra deeply striate...... ....4. **Edwardsii.**



1. **P. fimbriata.**—Blackish-brown above, chestnut beneath; prothorax much narrowed in front, hind angles feebly rounded; disc slightly impressed in front, finely, sparsely punctured, pilose only at the margin; elytra with distinct though not deep punctures and striæ; antennæ with the 6th joint not prolonged. Length 1.1 inch; 27 mm.

I have seen only the original specimen in bad condition, which has been figured in the U. S. P. R. R. Expl. and Surveys, Insects pl. 1,

f. 13. The anterior prolongation of the front is longer and narrower at base, than in the other species. The antenna is represented in fig. 1.

2. **P. Behrensii.**—Blackish-brown above, paler chestnut beneath, prothorax much narrowed in front, hind angles feebly rounded; disc rather strongly impressed in front, sparsely punctured, with a few larger punctures intermixed in the depression, and a few hairs near the tip; sides and beneath clothed with long hair as in the other species; elytra with distinct though not deep punctures and striæ; antennæ with the 6th joint prolonged. Length .85 inch; 22 mm.

♀.—Body very robust ovate, convex, strongly dilated behind; head concave, coarsely punctured, anterior prolongation short, broad, with the front margin feebly rounded; vertical horn short, broad, scarcely impressed at tip; prothorax strongly, tolerably densely punctured, with a narrow smooth dorsal line; tarsi short, one-third as long as the tibiæ, 5th joint thick, as long as the three preceding united. Length 1.20 inch; 30 mm.

California, near San Francisco; two ♂ and one ♂ kindly loaned me by Mr. Behrens. Antenna ♂ fig. 2; ♀ fig. 3.

3. **P. hirticollis.**—Blackish-brown above, chestnut beneath; prothorax much narrowed in front, hind angles feebly rounded; disc rather strongly impressed in front, tolerably densely punctured and with many long hairs proceeding from the punctures; sides and beneath with long hair; elytra rather feebly punctured and striate; antennæ with the 3d joint elongated, and 5th lamellate, a little shorter than the 6th. Length .78 inch; 20 mm.

♀.—Ovate, convex, less dilated than the other ♀ above described; frontal prolongation broad, feebly emarginate, vertical horn short emarginate; prothorax strongly and densely punctured, with a narrow smooth dorsal line; elytra feebly punctured. Length 1.42 inch; 36 mm.

Schaufuss, Nunquam otiosus, ii.

California, two ♂. The ♀ was given to me by Mr. A. Murray, and has lost all the tarsi and the antennæ. I refer it to this species with doubt; it is equally probable that it may belong to *P. fimbriata*. Antennæ ♂, fig. 4.

4. **P. Edwardsii.**—Blackish-brown, chestnut beneath; prothorax very strongly narrowed in front, with the hind angles broadly rounded, disc retuse, suddenly declivous in front and transversely impressed behind the elevation, finely not densely punctured; disc not pilose; elytra with deep punctures and striæ; antennæ with the 3d joint elongated, the 4th lamellate, one-half as long as the 5th (which is probably about one-half as long as the 6th and following). Length 1.05 inch; 26.5 mm.

One specimen with broken antennæ. It gives me great pleasure in dedicating this species to Mr. Henry Edwards, to recognize his kindness on many occasions, and his zeal in developing the Coleopterous fauna of the Pacific slope.

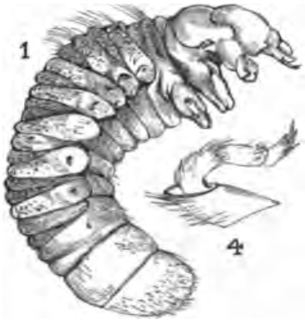
This species is recognizably described, though not properly named by Mr. Schaufuss (Numquam otiosus, vol. ii.). The name suggested for it by Mr. Crotch (Check List, p. 58), is likewise inadmissible, not only because he gives no reason for its adoption, and because that kind of list is an improper place for changes in nomenclature, but for the still stronger reason, that it tends to perpetuate in science the memory of the political venom which inspired the name given by Mr. Schaufuss. I cannot express myself too strongly on the necessity of keeping our scientific nomenclature free from all personal, political or religious prejudices or expressions of opinion. Such use of scientific publication, for intruding upon students of natural history irrelevant views respecting subjects, which are not comprised within the domain of their researches, must be discountenanced.

———o———

Description of the larva of PLEOCOMA, Lec.

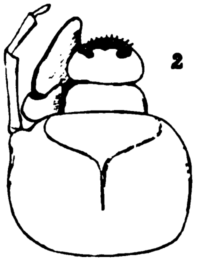
BY BARON R. OSTEN SACKEN.

The larva, sent for examination, is fresh from a recent moult. Some parts of the head, especially the parts of the mouth, are still covered by the old skin; exuviæ of the tracheal tubes protrude on both sides from the thoracic stigmata. I mention this in advance, in order to introduce a remarkable circumstance to be mentioned below.

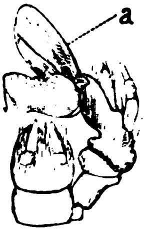


1

4



2



3

Larva (fig. 1) of the usual lamellicornian type, fat, soft, whitish curved, about 50 millim. long.

Head (fig. 2) rounded, yellowish-red, with the usual inverted Y-shaped impression in the middle; the occiput is longitudinally wrinkled; the front, preceding the epistoma, shows irregular transverse wrinkles; the space between front and vertex, especially on the sides of the head, is smooth and shining. The space transversely wrinkled bears some few bristles, more numerous on the sides. On the upper portion of the head I perceive six bristles, three disposed in a triangle, on each side of the χ-shaped line.

Epistoma trapezoidal; *labrum* semicircular, its upper coriaceous covering trisinuated anteriorly, with two small projecting lobes between the lateral sinuses; the lower, fleshy part is armed, as usual with minute, stout, erect bristles. Epistoma and labrum reddish-brown.

Antennæ three-jointed (not counting the scapus), but little advancing beyond the tip of the mandible; first joint subcylindrical, long; the second cylindrical, about ⅔ of the length of the first; the third very small, about ¼ of the length of the second and much more narrow.

Mandibles horny, very strong, dark brown or black, more reddish towards the basis, projecting but little beyond the labrum. When I first examined the larva, I found both mandibles looking alike, triangular, slightly curved towards the inside at tip, with a small tooth on the inside of the broad basis. I soon perceived however that the mandibles had not yet thrown off their old covering during the moult, and I easily removed from the left mandible, a horny shell, which after removal, preserved its former appearance. The mandible disclosed under it shows an altogether different structure, (compare fig. 3, a). It consists of a stout, reddish-brown horny basal piece, with a black, double tooth on the inside; on this basal part a black, horny, almost cultriform piece is inserted, slightly convex and longitudinally furrowed on the outside (the tip being smooth); concave and likewise with numerous longitudinal furrows inside. Between these two pieces the mandible shows an excision, in the shape of an angle of about 45°. of which there was no trace in the same mandible before moulting. The right mandible is probably of the same structure, but I did not remove its old skin; an opening in it however allows a partial view of the new mandible within.

Maxillæ (fig. 3) with two lobes; the outer and upper one small, cylindrical, with a few short spines and with a small conical, horny, piece at the tip, attached by an articulation; the inner and lower lobe is a little larger and beset with numerous spinelike bristles, and has, at the tip, a similar horny, but more unguiform, piece. *Maxillary palpi* apparently 3-jointed (besides a small basal piece), projecting but little above the maxillæ; joints about equal in length.

The *palpigerous piece* of the labium (fig. 3) is a fleshy tubercle, beset with bristles; the mentum under it is not an independent piece, and merely marked off by folds around it. The palpi are horny cones, inserted upon scutiform basal pieces; their tip does not project much above the fleshy labium upon which they are inserted.

The *thoracic segments* are more glabrous than the others, being beset on the upper side with transverse rows of sparse, soft hairs; the third segment, besides its row of hairs, has a row of minute spines. The breast and pleurae also have some long, and rather soft hairs. The first segment shows, above the spiracle, on each side, a pale yellow region of indefinite outline, ending anteriorly in a reddish yellow spot; this evidently is a rudiment of the horny plate which exists here in other lamellicorn larvæ.

The *feet* (fig. 4) are somewhat shorter than the rather large coxæ, they are beset with spine-like bristles, and end in a pencil of such bristles, almost hiding the small unguis between them. The front pair of feet is perceptibly smaller than the other two and has only small coxæ. All the feet are far apart at their bases.

The abdomen, above, is densely beset with minute spines, rather evenly distributed over seven dorsal segments and not quite reaching the stigmata on both sides; the eighth segment is almost free from them; the ninth or last segment is beset with them on its posterior part only, round the anal opening. A row of soft hairs runs across each segment, from stigma to stigma. The venter has similar rows of hairs, becoming very sparse on the last segments.

The thoracic, as well as the abdominal segments, are divided by deep furrows in transverse bolsters, the longest of which bears the stigmata at its ends. The last abdominal segment is as long or a little longer than the two preceding taken together and is divided in two halves by a transverse furrow. The anal opening is ⅄-shaped. The arrangement of the stigmata is the normal one.

When I compare this larva with the analytical table of the lamellicorn larvæ by Erichson, reproduced by Chapuis (Larves des col., p. 454), I find that it has the two separate maxillary lobes attributed to the Scarabaeidæ Laparosticti; it has the segments divided by deep furrows into transverse bolsters, like the subdivision *A* in that table (*Geotrupidæ*, *Aphodiidæ*, *Copridæ*, *Trogidæ*). When I further compare our larva with the few existing descriptions of larvæ of these groups, I soon perceive that the choice will lie between the *Geotrupidæ* and *Trogidæ*. The *Aphodiidæ* and *Copridæ* are excluded by the structure of their antennæ, maxillæ, labium, etc. Of those two groups we possess, as far as I am aware, only two good descrptions of larvæ: Mulsant's of the larva of *Geotrupes stercorarius* and Chapuis' of the larva of *Trox carolinus*. If we were to base our opinion upon these two descriptions only, it would incline in favor of a relationship of our larva with the *Trogidæ*, rather than with the *Geotrupidæ*. Chapuis' description of the larva of *Trox carolinus* agrees quite well with our larva; the description of the labium especially (lévre inférieure formée d'un menton et d'une piéce palpigére fondus en un real corps allongé) seems to indicate a structure somewhat analogous to that in our larva. On the contrary, Mulsant's description of the larva of Geotrupes disagrees with ours in several points. The antennæ are said to be four-jointed, the maxillæ to have two almost cylindrical lobes, the legs are described as bilobed at the end, etc. Finally, if it be true that the larva of Geotrupes has only two pairs of well developed legs, the third being almost atrophied, as Frisch (but not Mulsant) describes it, this would constitute another important difference.

Altogether, the materials at hand for comparison are too meagre for a final decision upon the relationship of the larva.

Before concluding I would advert once more to the singular fact that the shape of the mandibles changes after moulting. A similar peculiarity has been already observed among larvæ of other orders of insects. That the shape of the earlier mandibles is merely due to its being more worn is a supposition which will hardly be entertained by any one who has compared the two mandibles.

EXPLANATION OF THE FIGURES.

Fig. 1.—Larva from the side, natural size.
Fig. 2.—Head from above.
Fig. 3.—Labium, maxilla, and in front of them, the mandible *after moulting*.
Fig. 4.—Leg.

On the CUPESIDÆ of North America.

BY JOHN L. LECONTE, M. D.

PRIACMA, n. g.

Since I have seen the Australian genus *Omma*, I recognize in *Cupes serrata* (Lec. Proc. Acad. Nat. Sc. Phila., 1861, 351) a distinct genus, intermediate between that and *Cupes*. From the latter it differs by the antennæ less approximate at base, shorter and stouter, scarcely half as long as the body, with the joints triangular and narrower at the base, the 1st as long as but stouter than the 3d. The eyes are much smaller, though nearly smooth; the under surface of the head is quite different; gular sutures distant, curved slightly outwards, gular angles not porrected, but broad and truncate; mentum more prominent, maxillæ more exposed, maxillary palpi longer, last joint elongate, cylindrical, truncate. These differences were partly indicated by me in the remarks appended to the description of the species. The color is mottled gray; head with four subacute tubercles, but not lobed, front concave. Prothorax nearly square, with front angles prominent; elytra more convex, alternate interspaces feebly convex and a little uneven; side margins strongly toothed towards the tip.

Cupes lobiceps.—Body elongate, slender, pale gray, slightly mottled with darker; antennæ compressed, serrate for the lower half, two-thirds as long as the body; head deeply channelled and transversely impressed, thus divided into two large posterior tubercles or lobes, and two smaller frontal ones; there is also a lateral lobe behind the eye, separated by a deep groove, eyes large; prothorax suddenly narrowed in front, with the sides strongly elongated and a large median elevation which has a deep rhomboidal excavation; elytra with rows of moderate sized quadrate punctures, 3d interspace more convex. 5th, 6th and 7th forming an obtuse costa, 2d and 4th flat. Length .45 inch; 11 mm.

San Diego, California. A specimen kindly given to me by Mr. Ulke. This species resembles the figure of *C. Latreillei* Solier (Lacordaire, Gen. Col. Atlas, pl. 47, fig. 2) in the form of the antennæ. It differs conspicuously from our other species by the large posterior lobes of the head and the different sculpture of the prothorax. The following table will enable them to be easily recognized:—

A.—Antennæ serrate; gular sutures converging behind; eyes large. Cinereous mottled; head with four tubercles on the upper surface and two lateral; prothorax with elevated margins and disc............................1. **lobiceps.**

B.—Gular sutures parallel.

  a.—Antennæ as long as the body, filiform; eyes large. Cinerous mottled; head with four feebly separated tubercles; prothorax transverse, sides not elevated..2. **concolor.**

  b.—Antennæ nearly cylindrical, one-half as long as the body; eyes small. Black; head with fulvous hair; with two frontal and four occipital tubercles, the middle ones smaller and less elevated.........3. **capitata.**

Remarks on North American NOCTUIDAE with descriptions of New Species.

BY AUGUSTUS R. GROTE.

AGROTIS, Hübner.

Agrotis Normanianus, *Grote.*

♂ ♀.—This seems the species that is intended under the name of *triangulum* in the "List of the Noctuidae of North America." I have recently compared a fine series, taken by Mr. George Norman, with a number of European specimens of *triangulum*, part of which I owe to the kindness of my esteemed friend Professor P. C. Zeller. I have no question that our American species is distinct and Mr. Norman, who is of the opinion, thinks that there is a certain resemblance in our insect to the European (†) *depuncta.* The general appearance and style of markings of the two species, *triangulum* and *Normanianus*, is very similar. On a comparison of the male antennae, they seem more heavily bristled in the American species. The subterminal space anteriorly and the terminal space are darker shaded and contrast in *Normanianus.* There is a less general evenness of color on the primaries in our species, which wants the dark brown shade succeeding the basal half line on the sub-basal space. The ground color is more ashen, shaded and tinted with rose-brown. The geminate lines are narrower, the component lines equally marked. The t. p. line is less prominently lunulated inwardly. The orbicular is less *triangulate*, being more obliquely quadrate, owing to an angle being formed opposite to the reniform, this latter shorter and narrower than in the European form. The pre-apical black shade spot on the costal region before the subterminal line is single in *Normanianus.* The hind wings and undersurface are similar in the two species, but *Normanianus* is better marked and has the common line notably sinuate inferiorly on the hind wings; it is the smaller species, expanding 35–36 m.m. Worn specimens are of a dingy ocherous or olivaceous ashen, having lost the rosy tintings.

Canada, Eastern and Middle States. Imago in July and August.

Agrotis triangulum is cited in my list as American on the authority of Mr. Walker. This author has made several analogous determinations which will have to be probably corrected when we become acquainted with the European species. In the genus Agrotis we have determined American species under the names *Agrotis C–nigrum*, *plecta*, *baja*, *fennica*, *conflua*, *saucia*, and *suffusa*, after a comparison with European specimens, and in these instances we can find no differences to authorize any separation. With regard to *augur*, no comparison has been made, and our species may be different. No actual comparison has been made by us of *segetum* and *texanus*, but, after receiving specimens of the former, our species is believed to be identical. The Californian species identified as *lycarum* may not be the same, and indeed it is only with difficulty to be separated from *Cochranii*. A species has also been lately taken by Mr. George Norman, in Canada, which appears to be the same as the European *A. rubi* (=bella Tr.).

Mr. George Norman has kindly communicated to me his dates of capture of the species of Agrotis at St. Catherines, Canada, and I subjoin his statements.

A. **sigmoides** (*Guen.*). June 29. Not uncommon during July and August at sugar.
A. **augur** (*Fabr.*). July 3, at sugar, afterwards common during the month.
A. **baja** (*S. V.*) August 3, to September, at sugar.
A. **C--nigrum** (*Linn.*). August 2, to September, exceedingly common.
A. **Normanianus** *Grote*. July 31, up to September, not uncommon at sugar.
A. **bicarnea** (*Guen.*). July 31, to September, common.
A. **cupida** *Grote*. July 17, to August, not common.
A. **herilis** *Grote*. July 31, afterwards very common at sugar.
A. **tricosa** *Lintner*. August 3, afterwards very common to September, at rest and in breeding cage.
A. **subgothica** (*Haw.*). August 9, at rest, afterwards to September both at sugar and at rest as common as the prceeding two species.
A. **rubi** (*Viewig*). August 4, rare at sugar.
A. **volubilis** *Harvey*. September 6, at light and from breeding cage, not common.
A. **fennica** (*Tausch.*). August 10, at rest on paling, only one specimen.
A. **tessellata** *Harris*. June 30, afterwards swarming to end of July.
A. **clandestina** (*Harris*). June 19, bred, afterwards to July common at sugar.
A. **brunneicollis** *Grote*. September 4, one at sugar.
A. **alternata** *Grote*. July 1. bred, afterwards common at sugar to September.
A. **Cochrani** *Riley*. July 27, bred, afterwards very common at sugar and rest to September.
A. **saucia** *Hübner*. August 14, at sugar to September, not common.
A. **suffusa** (*S. V.*). June 5, at sugar, very common to September.

Eurois pressus, *Grote*.— ♂ ♀.—A slender bodied species of small size for this genus, resembling *Schœnherri*, H.-S. fig. 598, distinguished from the smaller forms described under *Aplecta* by Guenée, and which I have referred to *Mamestra*, by the naked eyes. The middle and hind tibiæ are spinose. The antennæ simple, scaled above, and setose beneath, not brushlike in the male. The color is a dusky gray and the species shows an affinity with *E. herbida* by the primaries being more or less distinctly shaded with green, principally from the base outwardly over the reniform, and along the submedian interspace. Orbicular large, round, a little oblique, black ringed, with pale center and an internal annulus; the discal space around the spot and before the reniform is more or less noticeably filled in with black. Reniform also pale, with fainter internal ringlet, black ringed, well sized. The transverse lines are obsoletely geminate, filled in with white, and this filling in rather strikes the eye and seems to be characteristic. The claviform is large, its upper black edge appears as a black arcuate line below the median vein, its lower edge is indistinct. The subterminal line is more or less obviously preceded by black shade dashes, usually determinate in pairs on submedian fold, between veins 4 and 6 and again subcostally; a dentate black terminal line defines the uneven margin of the wing; fringes gray. Hind wings very pale, shaded with fuscous terminally, with an irregular faint median fuscous line and black terminal linear edging; fringes whitish. Beneath very pale, subirrorate and shaded with fuscous, with a common line and discal marks. Palpi with the terminal joint white, the second black on the sides. Head whitish; thorax mixed with black. Abdomen weak, untufted. Expanse 36 mm.

New York; St. Catharines, Mr. Geo. Norman, No. 143.

Hadena mactata, *Apamea mactata* Guen. Noct. 1, p. 207. *Hadena mactata Grote,* List of the Noct. N. A. p. 15. ♂ ♀.—This species, with naked eyes, has much resemblance to *Mamestra claviplena* Grote, in size and color, though this is generally paler. Woodbrown; the median space darker shaded. A black dash at base, and one below it on internal margin. The geminate black lunulated median lines come nearly together on the internal margin. The t. a. line runs outwardly strongly obliquely. The t. p. line is roundedly exserted beyond the cell. Ordinary spots large, concolorous, pale; orbicular obliquely oval with a center stain; reniform with interior annulus. Claviform dark, concolorous, finely outlined in black, wide, not long, resting on a black dash which connects the t. a. and t. p. lines along the submedian fold. Subterminal space pale and the dentate s. t. line distinct, again paler, very near the margin. The woodbrown fringes are cut with pale, at the extremity of the veins. Hind wings dark fuscous with indistinct darker median line; fringes pale. Beneath pale, somewhat testaceous, irrorate and shaded with fuscsus, with a common uneven line and small pupilled discal marks on both wings. Head and thorax mixed pale and woodbrown. Expanse 28 mm.

No. 193, St Catharines, Mr. Geo. Norman. The discal marks beneath take the shape of small lunules with a more or less distinct pale center. Although Guenée's description is not very complete, it seems to me sufficient.

Hadena flava, *Grote.* ♂ ♀. This is a rather small species with clear bright yellow hind wings and broad black borders which reminds us at first sight of *Anarta cordigera.* The structural characters are those of *Hadena.* The eyes are naked. The squamation of the thorax is hairy. The dorsum of the thorax has an anterior and posterior divided tuft. All the tibiæ are unarmed. The dorsum of the abdomen shows determinate tufts. Fore wings blackish fuscous, t. a. line even, geminate, with fine bluish center, angulated. Ordinary spots small, blue gray, the orbicular oblique. There is a brown shade over the median space and subterminally before the s. t. line. T. p. line bent opposite the cell and most prominently exserted between veins 3 and 5, even, geminate, the inner black line most distinct, filled in with a bluish white shade which also follows it and obtains, within the s. t. line, to apices; terminal dots subcontinuous; fringes fuscous. At base there is a black streak before the angulation of the t. a. line and one below it on internal margin. Submedian fold marked with blackish across the median space. Hind wings bright yellow with broad black borders and whitish fringe; beneath pale, with a small discal spot and the border repeated. Body parts like the fore wings. Expanse 15 to 26 mm.

One fresh specimen from British Columbia, collected by the late G. R. Crotch, in Mus. Comp. Zool. Cambridge. One rubbed specimen from Colorado, collected by Theo. L. Mead, No. 19.

Hadena delicata, *Grote.*—♀.—The eyes are naked, the thorax with divided crests, the dorsum of the abdomen provided with reduced tufts. The antennæ are simple, pubescent, weakly brush-like beneath. A medium sized, dark purply brown-black species, with a slight mossy green shading on the forewings at base, on the ordinary spots and along the subterminal line, accompanying the markings. Median lines faint, geminate, the outer scalloped, the inner angulate. Orbicular moderate, black ringed, very near the t. a. line. Claviform unusually large, prominent, distinctly black edged, extending across the median field to the t. p. line. A paler wide shade extends obliquely beyond these two spots across the median field. This character reminds us of *Helotropha reniformis*, the species of *Prodenia*, etc., but it is here merely a broad lighter tinting of the ground color. Reniform indistinctly outlined, moderate, much shaded with black, the median shade visible obliquely within it over the costal region. Three divaricate white dots on the costa ante-apically. Subterminal line tolerably distinct and continued, irregular, with a rounded inward sinus above the internal angle, and minute projected denticulations opposite the cell, narrowly whitish, preceded by black points and shaded marks. A terminal series of black points. Hind wings pale fuscous, with a faint line and discal mark and a darker fuscous subterminal shade. Underneath with discal marks and very faint shaded fuscous common lines. Thorax, head, and appendages, concolorous with fore wings; faint black stripes on the tegulæ. Expanse 38 mm.

Hab. Illinois (Prof. Forbes No. 23).

HOMOHADENA *Grote.*

In this genus the ovipositor is extruded shortly. This is furnished with a row of distinct teeth, shorter in *H. badistriga*, and longer in *H. Kappa*. Between the teeth, along the groove, there is a stouter moderately dense coating of long hair.

Homohadena Kappa.—*n. s.*—♀.—Wood brown, more purely brown shaded subterminally. Median lines black, evident, approximate, fused by a black streak below the median vein, so that together they resemble the figure of the Greek letter K. A series of subterminal black dashes as in *H. badistriga*, that opposite the cell the longest. No traces of the ordinary spots. A terminal sublunulate black line. Hind wings fuscous with a faint median line, darker and not whitish at base, as in *H. badistriga,* than which this is a larger species. Beneath dark fuscous with subterminal common lines, distinct and subdentate on hind wings, within which the color is paler, and with inconspicuous discal spots. Body concolorous. Expanse 40 mm.

Hab. Kansas, Prof. Snow, No. 167.

I have a specimen from California, which is in poor condition, and which shows a superficial resemblance to this species in the disposition of the median lines. It is, however, smaller, differently colored, and appears to me generically distinct; the ovipositor is not visible exteriorly, and the abdomen is differently shaped terminally.

Pyrrhia angulata, *Grote* ♂ ♀.—The fore tibiæ without spines exclude the species from *Chariclea,* and I am led to believe it congeneric with *Pyrrhia exprimens* which it resembles, and which appears to be the American representative of the European *P. umbra* (Hufn). The new species is easily recognized by the angulated distinct median shade and the pale yellow secondaries. Thorax and forewings brownish-red. T. p. line very fine, thrice waved, perpendicular. Orbicular finely ringed, concolorous, with central dot. Median shade extremely prominent, angulated on the median vein within the base of the clouded reniform, denticulate superiorly, even inferiorly, blackish. The wing is lighter tinted from the base to this median shade. T. p. line black, very oblique, heavily marked, followed by a dark shading over the subterminal space. S. t. line uneven, interspaceally scalloped; fringes bright tinted; an extremely fine marginal line. Hind wings light yellow with blackish borders narrowing to apices and internal angle. Beneath yellow, the costa of secondaries and the narrower terminal band rosy speckled and tinted. Two black discal dots on the forewings on which the transverse band is blackish. Expanse 36 mm.

Buffalo, Mr. O. Reinecke. Coll Buff. Soc. Nat. Sci.

CATOCALA, *Schrank.*

I am happy to know that a more general interest in the species of this beautiful genus has followed the publication of my paper on the subject in these Transactions under the date of January, 1870. The determinations I then made, the material upon which they were based being deposited in the collection of this Society, allowed Mr. Herman Strecker an opportunity to determine his material and publish some generally good and useful lithographic plates of the species. Unfortunately, the text accompanying these plates, is the work of an unscientific person, whose most harmless idiosyncracy is a disregard of the rules of literary composition.

While these plates have been of great service in disseminating information on the genus, and while, from the circumstances detailed above, I can only endorse the accuracy of the determinations, there are one or two of the figures to which a proper exception should be made. That of *C. Faustina* has led to the reference of the species to the European *C. Nupta* by Mr. Möschler. I do not think the supposition is correct, and I have described the species comparatively in the proceedings of the Boston Society of Natural History. The figure of *C. unijuga* is also not good and looks as if it had been made from a worn specimen, while I see no reason to doubt the determination. An unacquaintance with specific characters in the genus, has allowed Mr. Strecker to confound *C. Meskei* with *C. unijvga*. The more pinkish hind wings with their greatly narrower and discontinued median band, the more even testaceous gray primaries of *C. Meskei* contrast specifically with the characters of the hind wings and the pulverulent, peppered, black and white, forewings of *C. uniguga*; while the median lines are *single* and not *geminate* in the slighter *C. Meskei* from Wisconsin and New York. I pass over as valueless the imputed identity of *C. Arizonæ* with any of the described Californian species, unfortunate as illustrating an unscientific animus, especially as it seems likely that it has been followed by a re-description of the species as *C. Aspasia* Strecker. From specimens in the Museum of Comparative Zoology of *C. illecta* from Texas, I can, with certainty, refer the *C. Magdalena* of Mr. Strecker to this species, since Mr. Strecker himself considered these specimens to belong to his supposed new species and his meagre description bears out the fact.

Through the kindness of several correspondents I have been supplied with much fresh material in the genus, so that I am now engaged upon a second paper on our species of Catocala.

I content myself here with describing three species from the Middle States and Canada, and two from Texas, all of which appear to me sufficiently easy of identification without the assistance of figures.

Catocala simulatilis, *Grote.*— ♀.—This species is intimately related with *C. obscura*, somewhat as *C. residua* with *C. insolabilis*. C. residua has blackish fringes, the general color of the primaries is dusky ashen, without the linear deepening in color above internal margin of *C. insolabilis*, while the whitish gray subterminal shade contrasts with the dusky tone of the wing. This species has also a black oblique subapical shade beyond the subterminal line, more or less distinctly following the teeth of the line and apparent sometimes within the line, following the two prominent teeth of the t. p. line. This black shading is wanting in *C. obscura* and *C. simulatilis*, which agree in the general *smoky* ashen primaries and the white fringes to the hind wings, but may be separated by the course of the t. p. line. This, in *C. simulatilis*, is much as in *C. residua* and the other species, with two very prominent teeth and wide open subreniform, whereas, in *C. obscura* the line is more perpendicular and presents a series of fine teeth. The resemblance is otherwise so great between the two that other comparison or description seems unnecessary. Since I only know males of *C. obscura* and females of *C. simulatilis*, I thought that my specimens of the latter might belong, as the opposite sex, to *C. obscura*. Such a sexual difference would be quite new and unusual, and I cannot now be blamed for not adopting such a determination. Expanse 65 mm.

Ohio, Dr. Hodge, two specimens.

Dr. Hodge has kindly communicated to me a specimen of *C. residua* taken in the same locality, and this species has also been taken in considerable numbers in Chatauqua County, New York, during the present summer.

Catocala Levettei, *Grote.*—♂ ♀.—Forewings pale smooth greenish gray, with very fine black transverse lines; the t. a. notched on s. c. vein, thrice rather deeply waved. T. p. line exserted opposite the cell, with a more prominent tooth, edged outwardly with white, the narrow open subreniform white filled. Subterminal line dentate, whitish filled between fuscous shades, from vein six a fuscous shading crosses the terminal space obliquely to below the apices. Terminal black interspaceal marks, followed by white, very distinct. Thorax like forewings, with mixed black scales on the collar and tegulæ. Hind wings black with blackish fringes. Abdomen above with a blackish shade. Beneath, the body parts are white; second joint of palpi black. The wings are white at base, with narrow pale interspaces between the bands, and resemble generally the other species. Expanse 45 to 50 mm.

Indianapolis, Mr. J. W. Byrkit.

The smallest species of black winged Catocala, except *C. tristis*, yet discovered. Smaller than *C. flebilis*, and with paler forewings, appearing like a minature *C. Robinsoni.*

I name this species with great pleasure after my kind friend, Dr. Levette, of the State Survey of Indiana.

Catocala innubens, *var.* **flavidalis.**

I have received from Prof. S. A. Forbes, Normal, Illinois, a specimen with the number "2" attached to it, which resembles C. innubens in *every* respect, except that the hind wings are dark yellow instead of orange. The condition of the specimen does not allow of the suggestion, that this change of color is owing to etiolation.

Catocala adoptiva, *Grote.*—♂ ♀.—Anterior wings wood brown, distinctly shaded with chestnut brown subterminally and before the t. a. line. The t. a. line is black, distinct, slightly three flexed, broad and diffuse superiorly. Subreniform larger than in *C. innubens*, black circled, filled with chestnut brown, closed. T. p. line with two prominent, subequal teeth, else not dentate but slightly waved with a rather deep inflection above vein 1. Subterminal line black, dentate, preceded by a whitish shade, obsolete on costal region. Hind wings deep yellow with the median band *oblique*, not rounded as in *innubens*, continued, lost in the fuscous hairs of the internal margin, angulated opposite the ante-terminal constriction of the marginal band which is very deep and sometimes nearly interrupts it. Beneath both wings yellow with the black bands narrower than in *C. innubens*. Expanse 64 mm.

Dallas Co. Texas (Boll).

A number of specimens in the Museum of Comparative Zoology. The different tone of the primaries, the larger chestnut brown subreniform and the shape of the black band of the hind wings, sufficiently characterize the species, and separate it from *C. innubens*, a species also taken numerously by Boll in the same locality.

Catocala coelebs, *Grote.*— ♀.— Allied to *C. Consors*; smaller, the abdomen fuscous, the median band of the hind wings broader, more even. Primaries ashen, shaded with black. Median lines broad, velvety black, distinct, continued. T. a. outwardly oblique, widely indented submedially, the extra basal space deepening in tone to the line which is followed by a whitish shade over the median space anteriorly. Subreniform pale, large, open to the t. p. line which is *strongly* and regularly dentate, without the usual discal projection. The t. p. line is followed by a deep brown shade after which the broad whitish subdentate subterminal shade band crowns the wing. Terminal space ashen. deepening outwardly. Hind wings light bright yellow, with a broad tolerably even median band continued, and joining blackish hairs on internal margin. Terminal band wide, comparatively even on its inner edge, enclosing a large distinct yellow apical spot, and with the yellow color appearing inferiorly as a line upon the margin. Fringe blackish. Beneath yellowish, deeper toned on hind wings with brownish marginal, and wide even black median bands. Expanse 54 mm.

St. Catharines, August 18, No. 182, Geo. Norman Esq.

Catocala anna n. s.—♂.—Size moderate, larger than *C. polygama*. Fore wings clear whitish gray, more purely white on the median space before the reniform and over the subterminal space. Ordinary lines approximate. T. a. line. geminate, black, superiorly diffuse and running evenly outwardly obliquely to below the median vein opposite the lower margin of the subreniform, which it nearly touches, and with which it seems to be connected by a prolongation of the black scales; below this angulation it runs downwardly sinuously to internal margin. Reniform rather large, black ringed, irregularly outlined superiorly, with an interior annulus, lying in a more bluish gray shade than the rest of the wing. T. p. line exserted, angulate, geminate, with a single sharp tooth opposite the cell, below which it is slightly acuminate on the interspaces forming a deep sinus before the margin nearly attaining the t. a. line. Subreniform whitish, colored by the pale oblique shading on the median space before the reniform, open. Subterminal line indistinct, well removed from the margin; terminal points small. Hind wings dusky or deep yellow. Median band oblique, rather narrow irregular in outline, constricted before it ceases, not attaining the internal margin. Hind border with lunulate interior edge, deeply constricted, perhaps sometimes entirely interrupted before anal angles. A very inconspicuous and reduced apical intrusion of yellow scales. Body part pale, abdomen somewhat yellowish. Beneath, dull pale yellowish with narrow, bands and with the hind wings stained inferiorly with orange yellow. Expanse 55 mm.

Texas (Boll. No. 104).

The following is a list of the seventy-three species of the genus inhabiting our Territory. In addition, a single species, C. electilis *Walk.*, is described from Mexico. I look for the number to be considerably increased so soon as California and the South-West become thoroughly explored. Even as it is, we have twice as many species as are found in all Europe. Names in the following list preceded by a (†), I have not been able to attach to any species. The sign ‡ indicates erroneous determinations; || indicates that the name has been previously used.

Buffalo, September 15, 1874.

CATOCALA *Schrank.*

§ Mormonia *Hübn.*
Epione (*Drury*).
lachrymosa *Guen.*
viduata *Guen.*
desperata *Guen.*
? *Phalæna vidua* Abb. and Sm.
retecta *Grote.*
flebilis *Grote.*
insolabilis *Guen.*
residua *Grote.*
simulatilis *Grote.*
obscura *Strecker.*
Robinsoni *Grote.*
Levettei *Grote.*
tristis *Edw.*
§ Catocala *Hübn.* restr. 1816.
relicta *Walk.*
Blephara *Hübn.* Tentamen.
Californica *Edw.*
† **Stretchii** *Behr.*
† **adultera** *Hinze.*
† **Irene** *Behr.*
Walshii *Edw.*
semirelicta *Grote.*
† **junctura** *Walk.*
unijuga *Walk.*
Briseis *Edw.*
Meskei *Grote.*
parta *Guen.*
C. perplexa || Strecker.
C. amatrix ‡ Walk.
Faustina *Strecker.*
coccinata *Grote.*
concumbens *Walk.*
amatrix (*Hübn*).
C. nurus Walk.
C. selecta Walk.
C. parta ‡ Walk.
Arizonae *Grote.*
† **Aspasia** *Strecker.*
cara *Guen.*
Aholibah *Strecker.*

marmorata *Edw.*
ilia (*Cramer*).
† **uxor** ‡ *Guen.*
† **Zoe** *Behr.*
ultronia (*Hübn*).
innubens *Guen.*
var. **scintillans** *G. & R.*
var. **flavidalis** *Grote.*
adoptiva *Grote.*

§

cerogama *Guen.*
§ Eucora *Hübn.*
communis *Grote.*
C. neogama Guen.
? Phal. neogama Abb. & Sm.
subnata *Grote.*
piatrix *Grote.*
C. palaeogama ‡ Walk.
palaeogama *Guen.*
var. **phalanga** *Grote.*
habilis *Grote.*
ponderosa *G. & R.*
C nebulosa || Edw.
consors (*Abb. & Sm.*).
coelebs *Grote.*
muliercula *Guen.*
badia *G. & R.*
antinympha (*Hübn.*).
Ph. paranympha ‡ Drury.
C. affinis Westw.
C. melanympha Guen.

serena *Edw.*
illecta *Walk.*
C. Magdalena Strecker.
Clintoni *Grote.*
† **nuptialis** *Walk.*
abbreviatella *Grote.*
Whitneyi *Dodge.*
Frederici *Grote.*
† **micronympha** *Guen.*
Anna *Grote.*
polygama *Guen.*
Amasia (*Abb. & Sm.*)
formula *G. & R.*
? **Ph. Amasia** ‡ Abb. & Sm. lower. fig.
† **connubialis** *Guen.*
Grynea (*Cramer*).
Nuptula Walk.
praeclara *G. & R.*
fratercula *G. & R.*
minuta *Edw.*
C. parvula Edw.
gracilis *Edw.*
C. similis Edw.
§ Corisce *Hübn.*
androphila *Guen.*
Ephesia amica || Hubn.
lineella *Grote.*
† **messalina** *Guen.*

DESCRIPTIONS OF NEW HYMENOPTERA.

BY E. T. CRESSON.

Agama albipes, n. sp.

♂.—Uniform dark honey-yellow, clothed with a long thin pale pubescence, more dense on abdomen; sparsely punctured, metathorax closely and rather coarsely reticulated; mandibles pale, with black tips and long hairs; palpi pale; antennæ yellowish-white, scape with long hairs; wings pale yellowish-hyaline, marginal cell with a fuscous cloud, rather narrow, about equal in length with the stigma, truncate at tip; second submarginal cell subtriangular, the third subquadrate, slightly narrowed beneath; legs entirely yellowish-white, clothed with a long whitish pubescence; abdomen more or less tinged with fuscous, ovate, petiolate, the petiole long, much swollen beyond the middle, strongly and rather closely punctured, the apex strongly constricted. Length 5—5½ lines.

Three ♂ specimens. Nevada.

Stizus nevadensis, n. sp.

♂.—Black; middle of face, clypeus, labrum, mandibles except tips, anterior orbits ending in two dots within the ocelli, tubercles, narrow posterior margin of prothorax, sometimes narrow line over tegulæ and a band or two spots on scutellum, both sometimes wanting, yellow; base of antennæ ferruginous; tegulate dull honey-yellow, with a yellow spot anteriorly; thorax with a very short, dense, changeable pile; wings pale yellowish-fuscous, marginal cell darker, costa more deeply tinged with yellow; legs ferruginous, sometimes more or less black at base, anterior femora beneath, four anterior tibiæ exteriorly, and base of posterior tibiæ, yellow; abdomen shining, pale yellow above, base of first segment, and basal and apical margin of all the segments narrowly black; on each side of first segment anteriorly an oblique, generally bifurcate black mark; anterior margin of second segment more or less undulate, and on each side anteriorly a rounded black spot; a short, oblique, black line on each side of second and third, and sometimes fourth, segments posteriorly; the yellow band on fifth, and sometimes fourth, deeply indented with black on each side anteriorly; six segment with a large, transverse, yellow mark; apical segment black, tipped with ferruginous, the anal spine rather long and acute; sometimes the base of second segment is ferruginous; venter black, sometimes varied with ferruginous, a yellow band on posterior margin of second segment deeply indented laterally. three following segments with a lateral yellow line or spot. Length 10—12 lines.

Three specimens. Nevada. The prevailing color of the dorsal segments of the abdomen is pale yellow, the band occupying nearly the entire width of the segment, leaving only a narrow black margin at base and apex; the basal margin of the yellow on first segment is more or less sinuous.

Vespa occidentalis, n. sp.

♀.—Black; clypeus, mandibles except tips, large triangular mark on front, anterior orbits filling the sinus, broad posterior orbits, scape in front, large elongated mark on each side of prothorax in front of tegulæ, a triangular spot beneath wings, two large transverse spots on scutellum, band on postscutellum interrupted medially, sometimes two spots on metathorax, and generally two small spots on mesothorax posteriorly, lemon yellow; clypeus rather broader than long, with a black dot on middle, the apex broadly and rather deeply emarginated, the lateral angles prominent; eyes and base of mandibles contiguous; tegulæ yellow, pupilled with black or brown; wings pale fuscous, legs lemon-yellow, base of femora more or less black; abdomen lemon-yellow, first segment with a black spot on each side anteriorly, not enclosed, and a large triangular one on the middle; base of second and the three following segments more or less broadly black, deeply indenting the yellow medially, and with a black spot on each side of the middle; apical segment black with a large triangular black spot on each side; venter yellow, with a transverse black spot on each side. second segment broadly black at base, confluent with the lateral black spot, the yellow band occupying the apical half of this segment divided by a black medium stripe. Length 8½ lines.

♂.—Resembles the ♀ in markings, except that the apical yellow bands on second and three following segments are much narrower and acutely indented medially and squarely on each side of the middle, the black spots not enclosed. Length 6 lines.

Three ♀ ♂ specimens. Collected in Nevada by Dr. H. C. Yarrow, and in New Mexico by Mr. Henshaw. Distinguished at once from *germanica* by the scape of antennæ being yellow beneath and by the different ornamentation of the first abdominal segment.

Agapostemon melliventris, n. sp.

♀.—Golden-green, very densely punctured, clothed with a pale ochraceous pubescence; anterior margin of clypeus, and mandibles, except tips which are black, yellow; antennæ black, scape at base and beneath pale yellow, flagellum testaceous beneath; metathorax coarsely reticulated, sometimes tinged with blue, the truncate apex enclosed by nearly semicircular carina; tegulæ pale yellow; wings pale yellowish-hyaline, nervines pale, legs yellowish with pale ochraceous pubescence, coxæ and base of femora black, more or less tinged with green; abdomen ovate, clothed above with a short pale sericeous pile, very dense at base of the segments, the fourth segment has a narrow black band across the middle and the following segments more or less tinged with black; beneath, the apical segments are more or less blackish. Length 4½ lines.

Three specimens. Easily recognized by the green head and thorax and the fulvous abdomen.

Halictus trizonatus, n. sp.

♀.—Black; finely, not densely punctured, clothed with a pale griseous pubescence, more dense on face, cheeks, sides of thorax, postscutellum and sides of metathorax; scutellum shining; enclosed space at base of metathorax finely, longitudinally rugose; tegulæ brown; wings hyaline, tinged with yellow, veins honey-yellow, subcostal nerve black; legs black, with short dense griseous pubescence; abdomen rather short ovate, convex, smooth and shining, base and sides with a long thin griseous pubescence, base of second, third and fourth segments each with a broad band of short dense white pubescence; anal rima fulvous. Length 4½ lines.

One specimen. Collected in Nevada by Dr. H. C. Yarrow.

Nomia nevadensis, n. sp.

♀.—Head and thorax black, rather densely clothed with a short ochraceous pubescence; three or four basal joints of antennæ and sometimes the middle of face and clypeus, fulvous; scutellum and metathorax fulvo-ferruginous; on side of thorax the pubescence is long and dense, and short and dense on anterior part of mesothorax, on posterior margin and on postscutellum; basal space of metathorax enclosed by a well defined carina, and longitudinally rugose; tegulæ pale honey-yellow; wings yellowish, with apical margin broadly fuliginous; legs fulvous, with dense ochraceous pubescence; abdomen fulvous, apical margin of the segments depressed, pale, and fringed with ochraceous pubescence; venter fringed with long ochraceous pubescence. Length 5½ lines.

♂.—Less robust and more densely pubescent, especially on the face; posterior femora much swollen and curved, the tibiæ dilated inwardly at tip, which has a short obtuse tooth, the margin above rather deeply emarginate; middle of first and second abdominal segments deeply and transversely excavated, the third less deeply so; fourth and fifth segments except apical margin, black, the third sometimes tinged with black. Length 5—5½ lines.

Eight ♂ ♀ specimens. Collected in Nevada by Dr. H. C. Yarrow. The pubescence is doubtless much faded from being long immersed in alcohol.

Melissodes nevadensis, n. sp.

♂.—Black, densely clothed with a long ochraceous pubescence; clypeus, labrum and spot on base of mandibles white; mandibles with pale fulvous stripe to tips; antennæ reaching beyond metathorax, black, scape densely pubescent; the pubescence on legs more yellowish, shading into brown on the tarsi; abdomen clothed with short black pubescence, that on first segment entirely ochraceous, a band on base of second segment, another near apex and also near apex of third and fourth segments of short dense pale ochraceous pubescence, sometimes there are indications of a band near apex of fifth segment; venter fringed with pale pubescence. Length 6½—8 lines.

Twenty specimens. Collected in Nevada by Dr. H. C. Yarrow.

Bombus nevadensis, n. sp.

♀.—Black; thorax above and three basal segments of abdomen above, clothed with a dense yellowish pubescence; wings black or dark fuliginous, legs clothed with black pubescence. Length 9 lines.

♂.—Like the ♀ except that the pubescence of the face and head above is yellowish; the face narrower and the eyes much larger, antennæ longer, etc. Length 8 lines.

Three ♂ ♀ specimens. Collected in Nevada by Dr. H. C. Yarrow, and in Arizona by Mr. Henshaw.

Description of new species of DIURNAL LEPIDOPTERA found in North America

BY W. H. EDWARDS, COALBURGH, W. VA.

Apatura Leilia, n. sp.

In markings allied to *Celtis*, but with the shape of *Clyton*, the primaries being more produced and hind margin more excavated than in *Celtis;* the hind margin of secondaries more sinuous and the inner angle more produced.

Male.—Expands 1.8 inch. Upper side of primaries next base and partly in the median interspaces, and of secondaries throughout, light red-brown; the remainder of primaries, which comprises the apical area to median and to cell, and the discal portion of the median interspaces, fuscous; hind margins bordered narrowly by fuscous; both wings have a submarginal black stripe and a little anterior to this, a second, which on secondaries is either very slightly crenated, or is crenated next outer angle and serrated posteriorly; primaries have a transverse discal row of seven white spots arranged in a double curve, the first two and fifth nearly equal, the third and fourth minute, the sixth and seventh, near inner margin, equal, rather smaller than the fifth and sometimes confluent; midway between this row and the margin is a second row of white spots and ocelli; the spots, two in number, being placed on the upper sub-costal and the discoidal interspaces; the three ocelli, on the lower sub-costal and the median interspaces, are black, rounded, the upper one small with an indistinct pale iris, the others large, nearly equal, and each surrounded by a pale brown nimbus; in the cell two transverse, equal, sub-reniform spots, one at the outer extremity, the other near the middle; these spots are obscure brown centrally, black at the edges, and are separated by a space that is white irrorated with brown scales.

Secondaries have the costal margin fuscous; upon the extra discal area a series of six black ocelli arranged as in *Clyton* and *Celtis*, the second from costa largest and back of the line, the sixth minute, the others nearly equal, rather more than half the size of the second; each surrounded by a shade slightly paler than the ground, and several having within small eccentric clusters of blue scales; on the middle of costal margin a white patch, and five small white spots in line with this pass round the extremity of the cell; in the cell two faint fuscous spots; fringes white in the emarginations, fuscous at the ends of the nervules.

Under side of primaries chestnut-red at base below the cell; also within the cell next base, but partly covered with gray, especially along the sub-costal nervure; remainder of wing pearl-gray, showing a brown sub-color on disc and in the middle of each interspace on the apical area, and at inner angle; the gray becoming suffused with pale blue as it approaches the hind margin; this margin narrowly edged with yellow-brown; the sub-marginal lines repeated, distinct, blackish-brown; the white spots repeated, enlarged, and in addition, a white patch in the outer row on costa; the lower spot of this row, in discoidal interspace, nearly conceals a small ocellus, a narrow edge of black being discernible on the anterior side, and the yellow iris being nearly complete; the other three ocelli re-appear, enlarged, each with blue scales and a well-defined yellow iris; the cellular spots as on upper side, the intervening space being clear white.

Secondaries pearl-gray, tinted with blue near hind margin; the gray shade least dense on the disk next before the ocelli, allowing a brown sub-color to appear; the sub-marginal lines repeated; the inner margin also bordered by a brown line; the white discal patch and spots repeated, and the line of spots extended across the wing to inner margin, following the course of a dark wavy line; the spots in the cell distinct, being transverse bars, the interior one prolonged into the next upper interspace; the ocelli repeated and each containing a large blue patch and edged by a narrow yellow ring which itself is edged indistinctly by fuscous; an additional ocellus on the inner margin, small, oval, also marked with blue.

Body above reddish-brown, beneath gray on thorax, yellowish on abdomen; legs ochraceous, the tibiæ gray; palpi clear white, fulvous above and at tip; antennæ yellow fulvous partly annulated with white; club fuscous at base, yellow at tip.

From two ♂, taken by Mr. Henshaw, of Lieutenant Wheeler's Exploring Expedition, August, 1874, at Camp Lowell and in Sonoto Valley, Arizona.

Argynnis Nausicaa, n. sp.

Male.—Expands 2.5 inches. Primaries strongly arched, moderately produced, hind margin straight.

Upper side deep red-fulvous on primaries, brightest on outer limb of secondaries, much obscured on basal area of each wing, but especially on secondaries, the dark portion reaching quite to the mesial band: hind margins edged by two heavy parallel lines, inclosing very narrow fulvous spaces throughout, divided by the black nervules; the submarginal lunules large, not touching the marginal lines, and inclosing spots of the ground color, except at apex of primaries, where they are paler; the rounded spots large; the mesial band heavy, confluent on secondaries; the marks in cell of primaries as in the allied species; on disk of secondaries a mark like the letter C inverted; fringes fulvous, fuscous at ends of nervules.

Under side of primaries almost wholly cinnamon-red, there being but a ferruginous patch near apex and buff in the middle of the subcostal interspaces; the markings repeated; the submarginal lunules black, the upper ones edged above by buff; the four or five inclosed spots next apex lightly silvered. Secondaries dark ferruginous, mottled very slightly with buff; the band between the two outer rows of spots clear buff, narrow, much encroached on by the ground color; all the spots well silvered; those of the outer row long, narrow next inner angle, lunular and broad on the upper half of the wing, all edged anteriorly by ferruginous; of the second row, the 1st and 5th are largest and equal, long semi-oval, the 6th same shape, one-half the size of the 5th, the 2d and 3d equal, long and narrow, the 4th minute, the 7th sublunate, all edged anteriorly by black; the third row of three spots, sublunate, edged with black; in the cell two round spots, and below cell an oval, all ringed with black; a silver spot in sub-costal interspace; the shoulder and inner margin lightly silvered.

Body dark fulvous, beneath gray fulvous on thorax, the abdomen buff; legs buff; palpi buff at sides, fulvous in front and at tip; antennæ fuscous above, fulvous below; club black, tip ferruginous.

Female.—Same size. Upper side deep fulvous, less obscured at base; the marginal lines on primaries confluent, and the lunules large, resting on the lines; the inclosed spots whitish next apex.

Under side of primaries as in the male, except that the upper outer part of cell is buff as well as the sub-costal interspaces; on the ferruginous patch a silver spot; the upper sub-marginal spots well silvered; secondaries more decidedly mottled with buff, the band still narrower.

From 2 ♂, 1 ♀, taken by Mr. Henshaw, August 21, 1874, at Rocky Canon, Arizona.

Argynnis Opis, n. sp.

Male.—Expands 1.5 inch. Primaries moderately arched, hind margin rounded; under side without silver.

Upper side uniform yellow-fulvous; primaries very little obscured at base, secondaries rather largely both at base and down the abdominal margin to the mesial band, that part of the wing being covered with a dense coating of dark brown bristling hairs; hind margins edged by two fine parallel lines, showing very narrow fulvous spaces between, and connected throughout with a series of small black lunules within which are fulvous spots; the extra discal spots small; the mesial band delicate, and confluent on secondaries; in the cell of primaries a wavy stripe crosses the lower median interspace and part of sub-median below cell; secondaries have on disc an incomplete black ring; fringes luteous, fuscous at ends of nervules.

Under side of primaries buff, very slightly, if at all, red tinted on basal area of primaries; the markings of the cell repeated, the mesial band represented by separated spots; the extra-discal spots obsolete except two or three next inner margin; the usual submarginal spots obsolete, or near inner angle represented by a few scales only. Secondaries have the discal area pale ochraceous somewhat mottled with faint red; the space beyond the second row of spots clear ochraceous; the submarginal spots faint, those of second row and those towards base scarcely more distinct; all these arranged as in *Cybele* and allied species and ochraceous, with no silver.

Body above fuscous with fulvous hairs; beneath, the thorax gray-fulvous, abdomen buff; legs buff; palpi gray fulvous; antennæ fuscous above, fulvous below; club black, the tip fulvous.

Female.—Same size and shape. Color deeper fulvous; both wings obscured from base nearly to mesial band; the marginal band and the connected lunules heavier; all the markings heavier than in the male. Under side of primaries red tinted except at apex, which is ochraceous; secondaries as in the male.

From several specimens taken at Bald Mountain, Cariboo, British Columbia, by the late G. R. Crotch, in 1873. This little species forms a group with *A. Bischoffi.*

Argynnis Clio, n. sp.

Primaries slightly arched, hind margins straight in male, convex in female.

Male.—Expands 2 inches. Upper side yellow-fulvous, very little obscured at base; hind margins bordered by two rather heavy parallel black lines, which on secondaries inclose narrow fulvous spots between the nervules, but on primaries are nearly confluent; on these rest a series of connected black lunules; the extra-discal rounded spots small; the common mesial band delicate, as are the markings in the cell of primaries, which resemble those of *Eurynome*; in the cell of secondaries the mark is shaped like the letter C, and nearer base is a round spot;

fringes luteous, fuscous at the tips of the nervules. Under side of primaries buff, tinted over basal area and disk with fulvous, at apex ochraceous; the markings of the disk repeated; the upper extra-discal spots wanting; the sub-apical patch indistinct, ferruginous; the submarginal spots are of the ground color with no silver.

Secondaries nearly same shade as primaries, the nervules ferruginous, and a tint of that color on the disk, especially at the top of the submedian interspaces; the basal area and inner margin as far as cell mottled with olivaceous, dusted with black scales; all the spots buff, with no silver and all those of the three rows edged above by a dusting of black scales; on the 2d row the first three, 5th and 6th are nearly equal, subovate, the 4th minute, the 7th lunular, and nearly all of this row have a small spot, composed of loose black scales, at the posterior side; the third row of three spots, semicircular; a 4th spot nearly obsolete next inner margin; in the cell an irregular spot; a long oval below cell, and a buff patch at base of sub-costal interspace.

Body above dark fulvous, below thorax gray-buff; abdomen buff; legs buff; palpi buff at sides, fulvous in front; antennæ fuscous above, fulvous below; club black, tip ferruginous.

Female.—Same size. Paler, the base more obscured; the marginal lines heavy and confluent; the lunules heavy, inclosing spots which are buff on secondaries, nearly white towards apex of primaries; a whitish shade over the sub-costal interspaces of primaries; all the markings heavy. On the under side of primaries the fulvous tint is deeper, otherwise as in the male. Secondaries have the ground inclining to ochraceous, mottled as in primaries; the spots entirely destitute of silver.

This species resembles *Eurynome* in size and shape. The first examples ♂ ♂ seen by me were brought in by Dr. Hayden's last Expedition to Montana, and were taken on the plains at the Teton Mountains. In 1874, a ♀ was sent me by Dr. Coues with other butterflies taken by the Northern Boundary Line Expedition, in the Rocky Mountains.

Grapta Rusticus, n. sp.

Male.—Expands 1.9 inch. Both wings moderately incised; tail long, broad, followed by a deep sinus and a dentation equally prominent with that at inner angle.

Upper side dull sordid fulvous, pale next apex of primaries; the marginal borders broad, that of secondaries occupying one third of the wing, well defined on its inner edge; the submarginal lunules small, pale yellow, almost white; the patches at apex and inner angle of primaries fuscous; the other markings black, arranged as in *Silenus* and other allied species; the two spots in cell of primaries often confluent, and all large; the fringes fuscous, white in the emarginations.

Under side mottled in shades of brown and greenish-gray, with a vinous tint over the basal area and disk; this area, limited by an irregular common band, which is sharply defined exteriorly and edged nearly throughout by a black line; on the inner side it is well-defined next the costal and inner margins of secondaries and is also edged with black; on the submedian interspace of secondaries this band projects a narrow spur to the inner margin just above the angle, and on the posterior side of this spur is a double sinus, all edged by black; the extra-discal space greenish-gray, mottled with pale brown and gray-white; a clear patch of the same gray on costal margin; the margin at the incision and the anterior part of the margin of secondaries olive-brown; the transverse spots on extra-discal area large, especially on the posterior half of each wing, olive-brown on a gray white ground; the submarginal lines olive-brown narrowly edged with black, and on primaries preceded by a conspicuous wavy stripe of black; the silver mark an angular open C, barbed roughly at the upper end, the lower end thickened and blunt, the two arms of equal length.

Female.—Same size. Similar to the male; the submarginal lunules more decidedly white; beneath similarly colored and mottled; on the posterior part of secondaries the extra-discal spots are joined to the submarginal lunules by gray patches; the silver mark delicate, the lower limb abbreviated.

Body above fulvous; beneath gray-brown; the thorax vinous; legs gray-brown; palpi light gray, with a few brown hairs interspersed, brown at tip; antennæ fuscous above, fulvous beneath; club black, tip ferruginous.

From specimens taken by Henry Edwards, Esq., at Big Trees, California, and on Vancouver's Island.

Grapta Silvius, n. sp.

Male.—Expands 1.9 inch. Hind margins deeply incised, strongly dentated; outer angle of secondaries much produced; tail broad, rounded; a prominent dentation midway between the tail and inner angle.

Upper side yellow-fulvous, bright red on the disks; both wings bordered by ferruginous-brown, narrowly on primaries, broadly on secondaries, and dusted throughout on the marginal edge by yellow scales; on the inner edge of the border of primaries a series of conspicuous yellow lunules which crosses a large ferruginous sub-apical patch; a smaller patch of same color at inner angle; the black spots disposed as in the allied species, there being a large sub-rectangular patch on the middle of costal margin, and five small rounded spots, two in cell and three at right angles to these in the median interspaces; the incision of hind margin edged by a dark line. Secondaries have a submarginal series of small yellow lunules, running through the middle of the border, which last is well-defined and passes abruptly into the fulvous ground of the disk; on costal margin a small black patch, a small spot at outer end of cell, and another at the origin of the median nervules; fringes almost wholly fuscous, there being but little white in the emarginations of the incision of primaries and upon secondaries.

Under side brown with a yellow tint, darkest over basal area and along the incision of primaries; the whole surface finely streaked with darker brown, but obscurely on the extra-discal area of both wings and below the cell of secondaries; costal edge of primaries gray-white mottled with brown; the common series of extra-discal spots complete, and consist of dark brown scales on an ochraceous ground, those next inner margin of primaries enlarged, and the interior scales replaced by ochraceous; the submarginal lunules on incision of primaries indistinct, and on secondaries obsolete; the silver mark an angular C, the lower limb thick and barbed, the upper limb slender, blunt at extremity.

Female.—Expands 2 inches. Similar to the male on upper side; the margins less dusted with yellow, especially on secondaries. Under side gray-brown, with a vinous tint; the markings nearly obliterated, most distinct on the costal margins; the streaks very fine; the extra-discal points dark green edged with black; the lunules distinct, dark green, edged with black; the silver spot reduced to a streak.

Body above fulvous, beneath vinous, the abdomen gray-brown; legs buff; palpi black in front, gray with fulvous hairs interspersed at the sides, fulvous above; antennæ fuscous annulated with dull white on upper side, pale ferruginous below; club black, tip ferruginous.

From California; sent me by Henry Edwards, Esq.

Grapta Oreas, *Edwards,* Trans. Am. Ent. Soc. Vol. II, p. 373, 1869.

Male.—Expands 1.5 to 1.9 inch. Primaries deeply incised; tail prominent, followed by a deep sinus and a sharp dentation; the inner angle much produced.

Upper side deep fulvous, spotted with black; the hind margins of primaries fuscous, preceded by a series of rather indistinct yellow lunules, near the apex somewhat replaced by white; the sub-apical patch and that at inner angle dull ferruginous; the spots arranged as in the allied species; secondaries have a broad marginal border, the outer portion fuscous, the inner ferruginous, and containing a series of small yellow lunules; a large black patch on middle of costal margin confluent with a spot at end of cell; fringes fuscous at ends of nervules, yellowish in the interspaces.

Under side brown over basal area and along the hind margins, paler across the discs, grayish sub-apically, and wholly streaked with darker brown; the extra-discal points black; within the incision of primaries and along the whole margin of secondaries a series of narrow blue-green lunules edged by black; in the darker examples these lunules are scarcely discernible; silver spot small, narrow, right-angled, the extremities pointed; sometimes the lower limb is thickened; and sometimes the upper limb is slightly bent.

Body brown-fulvous, below gray-brown, light on the abdomen; legs gray-brown; palpi black in front, gray with fulvous hairs interspersed at the sides; antennæ brown above, ferruginous below; club black, tip ferruginous.

Female.—Expands 2 inches. The extra-discal region paler than the basal; the submarginal spots much enlarged, lanceolate, indistinct. Under side as in the male, the markings often much obliterated; silver spot as in the male.

Found in California and Oregon, and allied to *Progne.* I formerly described this species from scanty material, but as I have received from Mr. Edwards a full series in both sexes, I have thought it well to rewrite and amend the description.

Thecla Siva, n. sp.

Male.—Expands 1 inch. Upper side castaneous, slightly brown at base, the costal margin of primaries and both hind margins rather broadly bordered with fuscous; secondaries have two tails, the outer one short, the other long, .16 inch, both dark fuscous, tipped with white; fringes fuscous.

Under side light fulvous, washed with pale metallic green, densely on the costal and upper part of hind margins of primaries, and over the whole of secondaries; a common pure white band crosses the discs of both wings, on primaries a little convex outwardly, and formed of lunules which are not quite confluent; on secondaries slightly wavy, and confluent; on the basal side of this band the fulvous ground color is deeper than elsewhere, and on secondaries several of the white spots are edged by a line of black scales; between the band and base no spots or markings on either wing; secondaries have the hind margin edged with white, the outer angle fulvous; the interspaces along the margin between the discoidal nervules and anal angle gray, caused by black scales on a white ground; on the lower median interspace above the gray patch is a rounded blackish spot on ferruginous ground, and this as well as the next patch on either side is surmounted by a black lunule; anal angle black.

Body gray brown above, beneath dark brown with white hairs interspersed, the abdomen yellow-gray; legs dark brown and white; palpi white, fuscous at tip; antennæ annulated white and black; club black tipped with pale fulvous.

From 2 ♂ taken by Mr. Henshaw at Wingate, Arizona, July, 1874.

This species is allied to *Castalis* and *Smilacis*, being of similar size and shape. On the upper side deeper red than *Castalis*, on the under side there is much resemblance to *Castalis* in the shades of color and in the common band. But this last is much less irregular than in *Castalis*, in which the separate spots that compose the band are not confluent and the two in the median interspaces are much behind the line of the rest; in *Siva* the line is scarcely broken at this point and is confluent; in *Castalis* are two conspicuous white spots nearer base of secondaries which are not represented in *Siva*. *Smilacis* is fuscous on upper side, and below is most like *Castalis*, the band being very irregular and the two spots next base appearing.

Description of a new species of CATOCALA from Arizona.

BY W. H. EDWARDS.

Catocala Editha.

Male.—Expands 3.3 inches. Primaries light gray brown, crossed longitudinally from base to a point just below apex by a blackish brown stripe; the transverse lines distinct; the basal nearly entire from the costa to middle of sub-median interspace, and there serrated in the form of the letter W, the middle serration being very small; the elbowed line has two prominent teeth, the upper one projecting about one-tenth inch; following these a deep ob-ovate sinus that reaches nearly to the basal line; on the lower edge of this sinus the line is twice serrated and then forms a re-entering angle to submedian nervure; a wavy gray serrated stripe crosses the extra discal area, anteriorly following the course of the elbowed line, but posteriorly nearly parallel to the hind margin; within the margin a series of brown points in the several interspaces, each on a gray streak coming from the margin; reniform bright brown, edged on the basal side with black. Secondaries bright rosy red; the median band rather broad, contracted on the middle on the outer side, even edged and with a circular curve on the inner side, terminating in a blunt point a little within the abdominal margin; the marginal border broad, and somewhat sinuous within posteriorly; the margin narrowly edged with yellow white, with fringes of same color.

On the under side the red shade covers rather more than one-third of the wing, but is partly wanting on the submedian interspace outside of the median band.

From a single specimen taken in Sonoto Valley, by Mr. Henshaw, July, 1874.

Descriptions of North American MOTHS.

BY AUGUSTUS R. GROTE.

Mamestra lubens, n. sp.

♂ ♀.—This species resembles in appearance the European *M. brassicæ* and should replace that species in the "List." It is equal sized but more variegated in color and more lilac tinged and wants the terminal claw to the fore tibiæ which distinguishes the European species, for specimens of which latter I am indebted to the courtesy of George Norman, Esq. Blackish with a faint lilac hue. Eyes hairy; abdomen strongly crested on the middle segments. Transverse lines black, indistinctly geminate, lunulate or waved. Claviform rather wide and obtuse, black margined. Orbicular full, subquadrate with pale or whitish filling, continuously black ringed. Median shade perpendicular, dentate. Reniform large, discolorous, filled in with white, with a yellowish stain and with a darker center, upright, not kidney-shaped, rounded superiorly, straight at base. Subterminal space paler and lilac-tinted, becoming yellow-brown before and along the whitish subterminal line which is continuous and shows the median dentations distinctly. Terminal black cuneiform marks evident. Secondaries wholly brownish fuscous with pale fringes and vague terminal line. Beneath paler with common vague transverse line and discal marks most distinct on hind wings. Expanse 45 mm.

Hab. Canada, Eastern and Middle States.

Heliothis cupes, n. sp.

♂.—Fore tibiæ with a longer inner and shorter outer terminal claw; all the tibiæ spinose. Forewings yellowish gray with all the veins finely marked by paler scales. Markings distinct. Basal half line geminate, pale centered, the inner blackish line most distinct. T. a. line geminate, the blackish component lines equally marked, slightly arcuate and uneven. Ordinary spots with darker centers and narrow black annuli pale margined within. Orbicular very near the t. a. line, rounded, well sized. Reniform with a pale central indistinct curved streak. T. a. line a little indented opposite the cell, the pale center more evident than the component lines, running inwardly below the reniform and narrowing the median space inferiorly. Median shade visible below the reniform, approximate to the t. p. line but divergent to the internal margin. The pale subterminal line is preceded by black cuneiform marks most distinct medially. Terminal line black, distinct, preceded by a pale line, broken by the veins. Fringes indistinctly interlined at base and interrupted by paler at the extremities of the veins. Hind wings pale at base, with the veins soiled with fuscous and with broad blackish borders narrowing inferiorly and centrally interrupted with pale, as is usual in the genus. Beneath very pale yellow gray, with distinct black discal marks and an outer curved transverse line, discontinued inferiorly, on both wings. Expanse 30 mm.

Hab. Texas (Belfrage, No. 95).

Appears to belong to the group with *peltigera*, *dipsacea*, etc.; the fore wings widen more outwardly and the markings are very distinct.

Cleophana occata, n. sp.

♀.—The eyes are naked. The frontal vestiture converges from the sides but conceals no clypeal protuberance. Tibiæ unarmed but the fore tibiæ have a blunt and short claw on the inside and a very short process outwardly. Collar pointed medially. Abdomen untufted. Collar above black, below gray-brown, tipped with pale gray-brown. Thorax pale gray-brown. Anterior wings gray-brown. Basal half-line indicated. Median lines obsoletely geminate, very approximate below the median vein. Median shade black, very diffuse, almost entirely filling the median space below the vein and bringing into relief the small concolorous claviform. Ordinary spots concolorous, small, subequal. Subterminal line consisting of whitish streaklets and points preceded by black longitudinal linear marks of unequal length and distinctness. Subterminal space shaded with whitish gray especially below vein. Fringes checkered black and brown. Hind wings whitish at base with soiled veins and rather broad, shaded and even blackish hind borders. Abdomen pale. Beneath with a common line broken into dots on the secondaries which are whitish, irrorate on costal region and have diffuse blackish borders. Head black with a pale interantennal line and pale oral squamæ and palpi. Expanse 27 mm.

Hab. Texas (Belfrage, No. 96, May 13th).

Orthosia disticha, *Grote.*

♂.—Eyes naked, with lashes; tibiæ unarmed. Thorax and abdomen untufted, the latter conical. Fore wings of a peculiar stone gray, sparsely intermixed with black scales, paler to the prominent brown median shade, more brownish beyond this. Basal half line faintly marked, angulate. T. a. line geminate, outwardly oblique to submedian fold below which it forms an inward angulation on vein 1. Orbicular obsolete. Median shade distinct, brown, outwardly oblique to median vein where it approximates to the reniform and forms a slight rounded outward angulation thence still outwardly oblique to internal margin. Reniform yellowish, somewhat medially constricted, distinctly outlined, with an inferior blackish stain. T. p. line geminate, sinuate, well removed outwardly, the component lines equally distinct. Subterminal line pale, subobsolete, indicated at costa by two distinct deep black triangulate marks, the lower the larger and showing also a small black inferior point on the succeeding interspace. Very faint indications of other black accompanying points. Fringes obsoletely blackish dotted. Hind wings wholly blackish fuscous. Body like forewings in color. Beneath paler, irrorate; hind wings with an obscure discal point, the common transverse line faint. Expanse 27 mm.

Hab. Texas (Belfrage, No. 99, Oct. 13th).

Perhaps this is Mr. Morrison's *Caradrina disticha*; if so, Mr. Morrison's generic reference is incorrect.

Agrotis excellens, n. sp.

♂ ♀.—The type of *auxiliaris* has the costal region from the base outwardly and the collar ashen. A second specimen, received from Mr. Belfrage, agrees with the type. Another Texan specimen differs by the costal region and lower half of the collar being light brown and contrasting. Otherwise the specimens nearly agree, differences of color excepted. In particular the specimens have the wide secondaries and narrow primaries in common. Credit is due to Mr. Morrison for the determination that the last named Texan specimen may be considered to belong to *auxiliaris*. I had sent it to Mr. Morrison determined as a new species together with the type of *auxiliaris*. From Mr. Henry Edwards I have now received four specimens in excellent preservation which agree very nearly with the Texan specimen above alluded to but differ by the broader primaries and smaller secondaries as well as in color and some details of ornamentation. The collar is produced in front and there are slight metathoracic tuftings. I have noticed dorsal crestings in *saucia* also, and it is evident to me that our observations on the genus are as yet far from complete. The ground color is rich purple brown with the costal edge, the internal margin and the subterminal space shaded with white. The large stigmata are shaded with whitish and the reniform is less kidney shaped than in *auxiliaris*. The males have these portions of the wing, except the stigmata, more of a bright ruddy brown. Compared with *auxiliaris* the subterminal space seems a little narrower. The claviform and the pale ray above it are like *auxiliaris*. The species seems a little stouter bodied. Above the hind wings are similarly colored, while less ample, but beneath there is but faint trace of the common line and the terminal dark border is obsolete in *excellens*, in which the under surface of both wings is more irrorate than in *auxiliaris*. Expanse 40—46 mm.

Hab. Vancouver Island (Mr. Henry Edwards, No. 5570).

Heliophila ligata, n. sp.

♂ ♀.—This slender species has pure white secondaries and fringes in the female while in the opposite sex these are slightly soiled. Fore wings whitish ocher-gray, faintly purple tinged, with the veins obsoletely white marked and accompanied by longitudinal blackish shades. Median nervure covered by a white streak, culminating in a white spot relieving a single inferior black dot, and accompanied by a black shading which continues diffusely to external margin, and leaves a clear ochery streak above it on the cell, reaching beyond the dotted transverse line. T. p. line indicated by a series of black nervular points. Very minute marginal black points; fringes a little paler than the wing. Thorax and head like primaries. Beneath without discal dots or common lines; a terminal dotted line on both wings; primaries and costal region of secondaries somewhat rosy gray, else the secondaries are whitish, subpellucid.

Under surface of body and legs of a slightly rosy gray. Collar faintly lined. Expanse 28 mm.

Hab. Texas (Mr. Belfrage, Dec. 2d, No. 156); also coll. Am. Ent. Soc., Oct. 12th.

This may possibly be Mr. Morrison's variety of *Phragmitidicola*. It is a distinct species and does not accord well with any of Guenée's descriptions that I have yet been unable to identify. From Mr. Morrison's remarks it cannot be identified with certainty so that in case it is the same I must be excused from adopting a name proposed for a variety, not willingly believing that it could be taken for a variety of *phragmitidicola*.

Prothymia orgiae, n. sp.

♂.—The palpi are long while in other respects the species agrees with *rosalba*, which Mr. Morrison has referred to this European genus of which I have seen no European representatives. The neuration has not been studied and the generic reference is not assured. The colors and appearance of this much smaller species recall the European *Xanthodes malvae*. The fore wings are triangulate with sharp apices. Above these are deep lemon-yellow, all the lines obsolete. Two light purple dots on the cell indicate the reniform and two obliquely placed similar dots probably indicate the position of the t. a. line. The t. p. line is better indicated by purple marks expanded on internal margin; it is very oblique, a little rounded opposite the cell. The fringes and external margin are washed with light purple. Hind wings and fringes wholly whitish. Collar and head stone purple, thorax clear yellow, abdomen pale. Beneath pale with a ruddy suffusion or irroration which especially clouds the primaries. Expanse 20 mm.

Hab. Texas (Belfrage, July 1, No. 122).

BOLINA.

Mr. Morrison refers *nigrescens* as identical with *fasciolaris* in a recent paper, and since this reference, I am informed, has been made after consulting Hübner's figure, I must ascribe it either to an unscientific motive or to a want of proper discrimination. I have identified Hübner's *fasciolaris* in the collection of this Society. It is totally distinct from the Texan *nigrescens*, the primaries are narrower and longer and have the large yellowish oval subterminal patch (within which the t. p. line runs) and which is shown so characteristically in Hübner's figure. Mr. Morrison's *fasciolaris* must be considered as a synonym of *nigrescens*. Intermediate between *Bolina* and *Syneda* are two species found in Texas which differ by a sexual palpal distinction. In the male the third palpal joint is short and thicker, hardly differentiated from the second. In the female it is thin and elongate. The male antennæ are more loosely and lengthily ciliate and the legs are slenderer. The male is more distinctly marked and is described as

Syneda deducta *Morr.* The female seems to be described as *Syneda pavitensis* by Mr. Morrison. The second species is much larger and appears to be undescribed. For the two species I propose the name *Cirrhobolina.*

1. Cirrhobolina deducta.

♂ *Syneda deducta.* Morr. Proc. Bost. S. N. H. 220.
♀ *Syneda pavitensis,* Morr. Proc. Bost. S. N. H. 221.

Texas. Both sexes in considerable variation as to the distinctness of markings on the fore wings collected by Mr. Belfrage.

2. Cirrhobolina incandescens, n. sp.

Expanse 40 mm. ♀.—This larger species differs from *deducta*, by the fore wings being uniformly ashen, shaded with brown along the subterminal line which shows a superior black mark with a blackish indistinct ringlet to the reniform and some blackish costal blotches, else all the markings and lines obsolete. Hind wings as in *deducta* but with the lunule *very pale* not *deep* yellow. The undersurface differs from *deducta* in the obsolescence and fragmentary state of the terminal black borders and the inconspicuous discal point on the secondaries. Taken Dec. 1, by Mr. Belfrage and numbered "17."

To the kindness of Mr. Henry Edwards I owe an opportunity of examining specimens of Syneda Edwardsii *Behr*, Syneda ochracea *Behr*, Syneda socia *Behr*, Syneda adumbrata *Behr*, Syneda divergens *Behr* and Syneda Stretchii *Behr*, the latter is a later name for Syneda Howlandii, *Grote.*

Bolina ochreifascia, *Harvey.*

This species very nearly resembles *B. nigrescens* in size and color but may be sufficiently distinguished and is characterized by an oblique median ochreous fascia which shows outwardly the brown median shade line. I have adopted Dr. Harvey's MS. name. I have never found *B. pallescens* G. and R., in any of Mr. Belfrage's Texan collections which I have examined since 1866. The type in the Society's collection was collected by Mr. Cresson in the neighborhood of New Braunfels.

Melanomma auricinctaria, n. g. et sp.

♂.—The antennæ are very shortly and coarsely bipectinate and the labial palpi are porrected and a little longer than usual. The hind tibiæ have two pair of spurs. The wings are elongate with arched apices and more rounded than in *Eupithecia.* The little moth has the appearance of *Cymatophora* (*Boarmia*) being gray with transverse dark lines. The inner line on the primaries is rivulous. An even broader shaded median line, inwardly oblique and a little arcuated, is angulated on the cell outside of a black cellular eyelike spot which shows some central metallic scales and is more or less completely surrounded by a metallic iris prominently visible in certain lights. The outer line is double, rivulous, angulated opposite the spot and obsolete on costal region. Subterminal line double, rivulous, including superiorly metallic scales above and below a subcostal indentation of the line. Hind wings paler with double median and exterior lines not continued to costa. Beneath the primaries show the black and here larger discal spot with a yellow iris very distinctly, as also metallic scales between the double subterminal line. Secondaries darker than on upper surface, irrorate, with faint lines. Expanse .75 inch.

Hab. Pennsylvania.

NOTE ON PAPILIO GUNDLACHIANUS.

BY A. R. GROTE.

As compared with *Machaon* and *Asterias* the Cuban species differs by the sinuate external margin of the fore wings while on the secondaries the discoidal cell is much smaller and the nervules thrown off at shorter intervals. The internal margin is folded in both sexes and in the male is brought entirely over, while the surface of the pouch thus formed is covered with whitish discolorous silky hair. The body is ornamented with scarlet patches of velvety consistence as in certain of the South American forms. I propose to make the species the type of a distinct genus which I name BLAKEA after my friend Mr. Charles A. Blake. *Blakea* differs by the metallic bands of the primaries which in the tailed species known to me are opake.

Descriptions of New Species of MUTILLA.

BY E. T. CRESSON.

Mutilla pecularis.

♀.—Long, linear, slender, brown-ferruginous; head slightly broader than thorax, transversely subquadrate; cheeks and occiput clothed with long pale, vertex with black, and mouth with long fuscous pubescence; flagellum except base blackish; thorax divided into two nearly equal parts, the anterior portion short, quadrate, covered with a dense appressed pale golden pubescence; posterior portion or metathorax rather longer than the anterior, rapidly sloping behind, sparsely pubescent and finely reticulated, substriate at base above; legs with sparse long pale hairs, anterior tibiæ and extreme tips of the two posterior pairs black, tibial spurs white; abdomen elongate-ovate, clothed with appressed fuscous pubescence, the apical margin of first and second segments narrowly and a spot on each side at apex of the first, silvery-white; apex of abdomen with long, sparse, erect, fuscous hairs; apex of first segment campanulate, petiole short and slender. Length 4 lines.

California. (G. R. Crotch.) A singularly formed species, belonging to division I. of the subgenus *Mutilla* as defined by Blake, but not allied to any of the species known to him.

Mutilla Edwardsii.

♂.—Elongate, slender, uniformly rufo-fulvous, densely and rather coarsely punctured, more feebly so on abdomen, clothed with a short, erect, tolerably dense, golden-fulvous pubescence; tips of mandibles and third and following joints of antennæ black; metathorax coarsely reticulated; wings blackish-fuscous, with a hyaline spot beneath third submarginal cell; abdomen shining. Length 6 lines.

Oregon. (Henry Edwards.) This handsome species is allied to *auripilis*, from which it differs by the less coarse punctuation and by the more dense uniform golden pubescence. Belongs to division I. sub-division I. of the subgenus *Sphæropthalma*.

Mutilla tecta.

♀.—Form elongate, subrobust, fuscous; head narrower than thorax, not broader behind the eyes; thorax short, subquadrate, broadest across the middle; abdomen oblong-ovate; entire body and legs clothed with a very long, dense, suberect, pale ochraceous pubescence, more sparse on body beneath and legs. Length 6 lines.

California. (Henry Edwards.) Allied to *magna*, but at once distinguished by the pubescence of body beneath and legs being pale ochraceous instead of black. This and the following species belong to division I., sub-division II. of the subgenus *Sphæropthalma*.

Mutilla erudita.

♀.—Form elongate, subrobust, black; head narrower than thorax, not broader behind the eyes; thorax subquadrate, narrowed behind and slightly so in front; abdomen ovate; head, thorax, abdomen above and sides of apical half of venter, clothed with a long, dense, erect, ochraceous pubescence; body beneath and legs sparsely clothed with black hairs, long on the femora beneath. Length 6 lines.

Searsville, Cala. (Henry Edwards.) Allied to *Sackenii.*

Mutilla pacifica.

♀.—Robust, black; head large, quadrate, slightly broader than thorax, extended and widened behind the eyes, occiput truncate; thorax short, subquadrate, broad anteriorly, slightly narrowed posteriorly; abdomen short-ovate; head, thorax, abdomen above and apical half of venter, clothed with dense, coarse, moderately long, bright sanguineous hairs; base of abdomen, body beneath and legs with less dense, coarse, black hairs. Lenth 5—7 lines.

California. (H. Edwards; G. R. Crotch.) Distinguished from *californica* by the shorter, more robust form and large quadrate head.

Mutilla Ursula.

♂.—Black; thorax and scutellum above, and abdomen above, except first and base of second segments, clothed with a dense golden-fulvous pubescence; wings black; second segment of abdomen shining, the pubescence sparse on the disk, the apical half generally divided into two more or less distinct, rounded, bright fulvous spots, sometimes confluent. Length 6 lines.

Var. **texana.**—Thorax entirely black.

Texas (Heiligbrodt); Oregon (H. Edwards). Allied to *bioculata.*

Mutilla Arota.

♀.—Robust, brown-ferruginous; head round, narrower than thorax; thorax short, subquadrate, slightly narrowed posteriorly; abdomen short-ovate, much broader than thorax; head, thorax at sides and beneath, and apex of abdomen and beneath, clothed with a moderately dense silvery-white pubescence, interspersed with long erect hairs of same color; the appressed pubescence on the head is very dense; thorax above and second abdominal segment above with a dense, appressed golden-fulvous pubescence, also interspersed with longer erect hairs of same color; legs blackish, with long pale pubescence. Length 3½ lines.

San Diego, Cala. (G. R. Crotch.)

Notes on the Species of RHIPIPHORUS of the United States.

BY GEORGE H. HORN, M. D.

The following essay is the result of a study made necessary by an attempt to name specimens which have been from time to time sent me.

The males have the antennae bipectinate or flabellate; vertex in front less convex and above more truncate than in the females; anterior tarsi feebly dilated, pubescent in most species, spinulose in two only. The form of the vertex and punctuation of the head have no specific value, while color has, if possible, still less. The prolongation of the maxillary lobes seems not to have generic value, specimens of *Macrosiagon* are before me in which the lobes are not at all visible while in *Rhip. limbatus* they are as long as in *M. dimidiatus* and the near association of these two species would certainly be very unnatural.

There are certain structural characters of great value which point out an arrangement of the species much more natural than any heretofore proposed, and when reduced to a tabular form the recognition of our species is made more certain.

In most of the species the prosternum is very slightly prolonged and the coxae are contiguous in their entire length. In *limbatus* and *linearis* the prosternum is prolonged into a slender process which is nearly as long as the coxae and which separates them in nearly their entire length.

In many species the second joint of the hind tarsus is much shorter than the third and flattened and rather broad above. In *cruentus* alone the second joint is longer than the third.

The following table will enable our species to be known.

Anterior coxae contiguous in their entire extent.
  Anterior tarsi ♂ spinulose beneath; elytra very acute.
    Basal lobe of thorax with a strong elevation; second joint of hind tarsi not flattened above.. **flavipennis.**
    Basal lobe of thorax transversely notched at tip; second joint of hind tarsi flattened above.. **dimidiatus.**
  Anterior tarsi ♂ with three joints pubescent beneath.
    Second joint of hind tarsi shorter than third and flat above.
      Thoracic lobe with obtuse elevation and a deep fovea on each side.
      bifoveatus.

Thoracic lobe not elevated, surface regularly convex.

Metasternum very densely punctulate, punctures closer together than their own diameter..**octomaculatus.**

Metasternum more shining, moderately punctured, punctures distant at least their own diameter....................................**pectinatus.**

Second joint of hind tarsi longer than third, subcylindrical. Lobe of thorax neither carinate nor notched.................................**cruentus.**

Anterior coxae separated in nearly their entire length by a slender prolongation of the prosternum; vertex scarcely elevated, obtuse and nearly impunctured.

Second joint of hind tarsi longer than half the third and not flattened above. Epistoma oval ....**linearis.**

Second joint of hind tarsi shorter than half the third and flattened above. Epistoma truncate.......... ....**limbatus.**

Rh. flavipennis Lec. New Spec. 1866, p. 153; *abdominalis* ♀ Lec. l. c. p. 154.

Male.—Color entirely black, elytra pale yellow. Vertex slightly concave in front, moderately punctured, upper edge sometimes rounded, frequently subtruncate or even slightly emarginate. Antennae pale luteous. Thorax moderately densely punctured, a slight impression on each side of the middle in front, basal lobe strongly elevated, and produced at tip. Elytra contiguous for a short distance at base, rapidly narrower and very acute at tip. Body beneath black, not densely punctured. Legs black, spurs and claws yellowish. Second joint of hind tarsi scarcely shorter than the third, not flattened above.

Var.—First three segments of abdomen red. California.

Female.—Black, abdomen red. Elytra pale yellow at basal half, tip black. Antennae black, basal joint piceous, second somewhat paler.

Length .30—.40 inch; 7.5—10 mm.

This species occurs in Pennsylvania, Georgia, Illinois and California, (Owen's Valley).

Rh. dimidiatus Fab. Spec. Ins. I., p. 332; Oliv. Ent. III., 65, p. 8, pl. 1, fig. 8, a—b; Hentz, Trans. Am. Phil. Soc. III., p. 464; Gerstaecker Monog. p. 21; *marginalis* ♂ Lec. New Species, 1866, p. 154.

Male.—Body entirely black, elytra pale yellow, with the outer and sutural margins and tip narrowly bordered with black. Antennae pale luteous. Thorax without apical impression, lobe feebly convex, transversely emarginate. Elytra flat, sparsely punctured, smooth, rapidly narrower and very acute at tip. Vertex in front moderately convex, smooth, very sparsely punctured, above rounded. Legs black, spurs and claws rufous. Second joint of hind tarsi shorter than the third and flattened above.

Female.—Body black, elytra with basal half pale yellow, apical half black. Antennae piceous, two basal joints rufous.

Length .20—.36 inch; 5—9 mm.

The male in my cabinet came from the collection of Count Dejean and was given me by Mr. Fred. Bates. It bears the name *flavicornis.*

The species thus far is known within the limits of New York, Florida and Missouri.

Rh. bifoveatus, n. sp.

Male.—Color entirely black, elytra brownish, gradually becoming black at base, a small arcuate space one fourth from the humerus pale luteous. Antennae pale brownish. Vertex in front convex, sparsely punctured. Thorax with a very deep impression, on each side at base, the two foveae separated by an obtuse elevation; lobe at tip not elevated, transversely notched. Elytra contiguous for a very short distance, rapidly narrower and very acute at tip, disc of each elytron with a broad moderately deep longitudinal channel, surface very sparsely punctured. Body beneath very sparsely punctured. Legs black, claws luteous. Second joint of hind tarsi shorter than the third, rather broadly flattened above. Length .44 inch; 11 mm.

One specimen in my cabinet from Illinois.

Rh. octomaculatus Gerst. Monog. Rhip. p. 22; *bicolor* Say, Journ. Acad. 1823, p. 275; *Sayi* Lec. Journ. Acad. IV., 1858, p. 21; *puncticeps* Lec. loc. cit. p. 20.

The color of this species is so extremely variable that it may be best described under its varieties. The general characters of all are as follows:

Thoracic lobe not elevated, tip obliquely truncate and concave. Elytra above nearly flat, feebly longitudinally concave, contiguous for a short distance at base, rapidly narrowing to tip and acute. Body beneath (metasternum especially) very densely and finely punctured and clothed with fine silken pubescence. Second joint of hind tarsus shorter than the third and rather broadly flattened above.

Male.—Antennae pale rufous, rami black. Vertex in front moderately convex, sparsely punctured.

Female.—Antennae black, two basal joints rufous. Vertex in front either flat or slightly concave, moderately densely punctured.

Var. **octomaculatus** Gerst.—Color ferruginous. Head black. Thorax with an elongate black spot on each side. Elytra each with three black spots, humeral, median and apical. Legs black, anterior femora rufous tipped with black.

The two thoracic spots are characteristic of this variety. The elytral spots may entirely disappear. One specimen is before me with the median spot alone remaining and merely as a black point. The legs and head may be entirely ferruginous.

Var. **puncticeps** Lec. — Body beneath, head and legs black. Abdomen rufous. Thorax rufo-testaceous without spots. Elytra similar in color, each with three spots as in the preceding variety but smaller.

Var. **Sayi** Lec., *bicolor* || Say.

Male.—Body beneath, head and legs black. Thorax and elytra rufotestaceous, the latter tipped with black.

Female.—Body black. Abdomen red. Head rufous or black. Legs black. Thorax uncolored. Elytra with three black spots as in *octomaculatus.*

Length .20—.52 inch; 5—13 mm.

This species occurs in Florida, Georgia, Kansas and Texas, and according to Gerstaecker, at Cayenne, S. A.

Rh. pectinatus Fab. Syst. Ent. p. 263; *sexmaculatus*, Fab. loc. cit; Oliv. Ent. III., 65, p. 7, pl. 1, fig. 6; *nigricornis*, Fab., *humeratus*, Fab., *tristis*, Fab. Syst. El. II., p. 119; *ventralis*, Fab. loc. cit. p. 120: *sanguinolentus*, Germ. Ins. Spec. nov. 1824, p. 169; *dubius*, *impressus*, *maxillosus*, Mels. Proc. Acad. II., p. 316; *niger*, *fasciatus*, *ambiguus*, *longipes*, *thoracicus*, Mels. loc. cit. p. 317; *varicolor*, Gerst. Monog. Rhip. p. 25.

General Characters.—Body beneath rather sparsely punctured, punctures distant from each other at least equal to their own diameter, surface scarcely visibly pubescent. Thoracic lobe not elevated, transversely notched at tip. Second joint of hind tarsus shorter than the third and flattened above.

Male.—Vertex in front convex, very sparsely punctured, shining. Antennae rufous with black rami.

Female.—Vertex less convex, more distinctly punctured. Antennae black, two basal joints rufous.

Length .14—.32 inch; 3.5—8 mm.

The varieties are so numerous as to be entirely beyond description in a paper with the scope of the present. A few of the more important may be mentioned without names.

Var. 1.—Body entirely black above and beneath, abdomen ♀ red.

Var. 2.—Body as above. Thorax rufo-testaceous.

Var. 3.—Body black, elytra rufo-testaceous.

Var. 4.—As in 3, elytra tipped with black.

Var. 5.—As in 4, with a median elytral spot.

Var. 6.—As in 5, with a humeral spot.

Var. 7.—Black, abdomen red, thorax rufous, elytra black with sub-basal spot red.

The form described by Fabricius as *tristis* (*fasciatus*, *niger* Mels.) is composed of the more diminutive specimens which occur more especially in the Northern States. They are of a generally darker color.

This species is distributed over our entire country south of a line from New York to Kansas.

It will be noticed that this species varies in a manner similar to the preceding. The only difference that I can discover between the two is in the punctuation of the under side of the body.

Rh. cruentus, Germ. Ins. Spec. Nov., 1824, p. 168; Gerst. Mon. p. 27; *rufus*, Lec. Proc. Acad. VII, 1854, p. 225.—Thoracic lobe not elevated nor notched. Elytra contiguous for nearly half their length, narrowed in a curvilinear manner and not acuminate at tip. Second joint of hind tarsus longer than the third and sub-cylindrical.

Male.—Head moderately convex in front, shining, very sparsely punctured. Antennae black.

Female.—Similar to the male, antennae black, basal joint testaceous.

Var. **cruentus**, Germ.—Body and legs entirely black. Abdomen ♂ black, very rarely red, abdomen ♀ red, rarely black. Elytra red, apex and narrow basal margin black.

Var. ———.—Body as in the preceding. Thorax rufo-testaceous. Elytra with tip and base very narrowly black. Head black.

Var. **rufus**, Lec.—Body above, beneath and legs rufo-testaceous. Antennae above black with pale basal joint.

Length .20—.30 inch; 5—7.5 mm.

Occurs from Georgia to California.

This is the only species of the genus in our fauna in which the second joint of the hind tarsus is longer than the third.

Rh. limbatus, Fab. Ent. Syst. I., 2, p. 112; Oliv. Ent. III., 65, p. 6, pl. 1, fig. 5, a—b; Say, Bost. Journ. 1, p. 189; Gerst. Mon. p. 30.—Head pale rufo-testaceous, occiput frequently black, vertex smooth, convex, impunctured. Thorax similar in color with discal spot of variable size black, hind angles prolonged and slightly covering the elytral humeri. Elytra usually black, sometimes pale luteous with the entire limb, suture and base narrowly black. Body beneath pale rufo-testaceous, frequently with the sternal side pieces black. Anterior coxae separated by a slender, prolonged prosternum. Femora pale tipped with black; anterior tibiae black, middle and posterior tibiae pale, apical half black. Tarsi black, claws pale. Thoracic lobe not elevated nor notched at tip. Second joint of hind tarsus shorter than third and broadly flattened above.

Male.—Antennae black, two basal joints pale. *Female.*—Similar.

Length .24—.40 inch; 6—10 mm.

This species occurs from Pennsylvania to Texas.

Rh. linearis, Lec. New Species, 1866, p. 154.—Form linear, color piceous with iridescence. Vertex convex, smooth, impunctured. Thorax sparsely punctured, base on each side straight, hind angles not prolonged, lobe equilaterally triangular, tip not elevated nor emarginate. Elytra as in *limbatus*. Second joint of hind tarsus longer than half the third and not flattened above. Body beneath shining black, sparsely punctured. Femora black, tibiae and tarsi rufo-piceous.

Male.—Antennae black, two basal joints testaceous.

Female.—Unknown.

Length .16 inch; 4 mm.

This species agrees with *limbatus* in having the anterior coxae separated by a slender prolongation of the prosternum.

One male is known. Collected by Mr. Ph. J. Wild, in Kentucky.

Mr. Fred. Bates placed at my disposal a number of specimens with the original labels, which formerly made part of the collection of Count Dejean. These are as follows:

R. dimidiatus.

R. flavicornis = ♂ **dimidiatus.**

R. humeratus = **octomaculatus** *var.* **Sayi.** If this is the true *humeratus* Fab., the name should be substituted for *octomaculatus*.

R. marginalis, ventralis, rubidus = varieties of **pectinatus.**

R. affinis, zonatus = **cruentus.**

R. discicollis = **limbatus.**

Synonymical Notes and Description of New Species of NORTH AMERICAN COLEOPTERA.

BY GEO. H. HORN, M. D.

CICINDELIDÆ.

Amblychila Piccolominii Reiche is *cylindriformis* Say.—After an examination of the type of this species I am convinced that the views already expressed by Lacordaire and Leconte are correct. The species is doubtless a male and identical with those in the cabinet of Dr. Leconte.

CARABIDÆ.

Carabus fulgidus Gebler, in the cabinet of Baron Chandoir from Alaska.

Carabus hortensis Fab. Specimens in the cabinet of Mr. Andrew Murray of London, are said to have been collected in the Hudson's Bay Region. Before the species is introduced into our lists it would be better to await the occurrence of other specimens.

Calosoma subæneum Chaud. Rev. et. Mag. Zool. Jan. 1869, and *C. latipenne* Horn, Trans. Am. Ent. Soc. June, 1870, are identical.

Omophron nitens Chaud., Rev. et Mag. Zool. 1868, is *labiatum* Fab.

Omophron nitidus Chaud., loc. cit. is *nitidum* Lec.

Evarthrus ovulum Chaud., Rev. et Mag. Zool. 1868, is certainly identical with *acutus*, Lec. There are positively no known characters for separating it as a variety much less as a distinct species.

Anisodactylus haplomus Chaud., Rev. et. Mag. Zool. 1868. I cannot see any valid reason for separating this from our common *rusticus*.

A. (*Gynandrotarsus*) *elongatus* Chaud., loc. cit. is *opaculus* Lec. I have seen a tolerably large series of this species and find that it is impossible to distinguish the two above indicated.

Harpalus occidentalis Chaud., loc. cit. is *fraternus* Lec.

Harpalus liobasis Chaud., loc. cit., does not appear to be a species occurring within our faunal limits. It may be Mexican.

TRECHICUS, Lec.

Trechicus umbripennis Lec., is the *Bembidium nigriceps* Dej. The synonymy has been determined by a comparison of specimens.

The synonymy of *Trechicus* needs some correction. Chaudoir calls the above species a *Perigona*. Lacordaire places the latter as synonymous with *Mastigus*. In the Catalogus (Gemm. et Harold)

Perigona is *Somoplatus.* Finally the same genus has been redèscribed by Morawitz as *Pentoplogenius,* (determined by Leconte). Until the synonymy is finally settled the name *Trechicus nigriceps* (Dej.) will be retained.

T. pallipennis Lec. does not appear to differ specifically from the above.

AMARA Bon.

A. reflexa Putz. Three specimens of this species sent by Putzeys and Chaudoir are identical with *lacustris* Lec., the latter being according to Dr. Leconte the *rufimana* Kirby.

A. obtusa Lec., does not appear to differ essentially from *hyperborea* Dej. In the type of the latter is seen a fine basal line near the hind angles which is not evident in the former.

The species included in the division *Amara* (Proc. Ac. 1855, p. 346) may be known by the following table:

- A.—Antennæ not carinate.
  - Prosternum ♂ with a large and moderately deep puncture.
    - Base of thorax punctured..**insignis** Dej.
    - Base of thorax smooth..**insularis** n. sp.
  - Prosternum ♂ without puncture.
    - Scutellar stria terminating in ocellate puncture. { **impuncticollis** Say. / **littoralis** Esch.
    - Scutellar stria without ocellate puncture.
      - Striæ of elytra punctured, base of thorax finely punctate..**basillaris** Say.
      - Striæ not or only obsoletely punctured, base of thorax smooth.
        - Thorax broad, moderately deeply emarginate in front.
          - Thorax narrowing from basal angles to apex, form broad robust, terminal spur of anterior tibiæ stouter than usual......**crassispina** Lec.
          - Thorax narrowing from in front of base, form oblong oval, spur normal.
            - Legs piceo-rufous; hind angles of thorax slightly obtuse, the puncture rather distant from the side margin.........**cupreolata** Putz.
            - Legs black; hind angles sharply rectangular, the puncture equidistant from basal and lateral margins..................**conflata** Lec.
        - Thorax but little wider than long, apex very feebly emarginate, basal angles sharply rectangular..............................**brunnipes** Motsch.
- B.—Antennæ with joints 2—3 carinate above.
  - Scutellar stria with ocellate puncture..................................**fallax** Lec.
  - Scutellar stria without ocellate puncture.
    - Basal impressions of thorax very faint.
      - Striæ obsoletely punctured, base of thorax subpunctate. **subpunctata** Lec.
      - Striæ impunctured, thorax not punctured.
        - Form rather broadly oval..**confusa** Lec.
        - Form oblong oval..**protensa** Putz.
    - Basal impressions well marked..**polita** Lec.

A. inepta Lec. appears to be a female of (*Celia*) *erratica.*

A. convexa Lec. is a female of *polita.*

A. insularis, *n. sp.*—Form oval, robust, piceo-æneous, shining. Head smooth, frontal impressions feeble. Antennæ not carinate at base, pale rufo-testaceous. Thorax one-half broader than long, slightly narrowed in front, convex, sides moderately arcuate from the basal angles; apex very feebly emarginate, anterior angles broadly rounded, base not sinuous, hind angles nearly rectangular, not obtuse; surface smooth, shining, basal impressions nearly obsolete. Elytra rather broadly oval, finely striate, striæ entire, impunctured, intervals flat. Body beneath and legs, piceo-rufous, smooth and shining. Length .38 inch; 9.5 mm.

Male.—Hind tibiæ pubescent within, prosternum with deep puncture.

The form and general appearance of this species is almost exactly that of *californica* although somewhat larger. It must however be referred to the present group and by the presence of the prosternal puncture in the male its place is near *insignis* from which it differs by its more oval form, different color and smooth thorax.

Two specimens in the cabinet of Dr. Leconte, from the island of San Clemente on the coast of California.

The following species are the North American representatives of the sub-genus *Bradytus* Zimm.

Prosternum with side pieces smooth.
  Prosternum ♂ with oval punctured space.
    Meso- and metasternal side pieces punctured, scutellar stria very short or entirely wanting..**exarata** Dej.
    Meso- and metasternal side pieces smooth, scutellar stria very long. **latior** Kby.
  Prosternum ♂ not punctured but feebly longitudinally sulcate in both sexes.
    Meso- and metasternal side pieces smooth, scutellar stria long. **septentrionalis** Lec.
Prosternum with side pieces punctured, meso- and metasternal side pieces punctured, scutellar stria long................ ....**Putzeysii** n. sp.

A. glacialis Mén., formerly placed in this group, is said by Putzeys to be a *Curtonotus* (Lirus). I have seen only females.

A. exarata Dej., *furtiva* Lec.

I cannot detect any difference between these two species. The original specimens of the latter were immature and differed somewhat in the punctuation of the thorax from *exarata*. A larger series from intermediate portions of the country indicate the want of value of the characters which appeared to distinguish the two species at first.

A. latior Kby., *libera* Lec., *hyperborea* ‡ Lec., *lævistriata* Putz., *oregona* Lec.

Late collections from Colorado and New Mexico show the advisability of uniting *oregona* as a synonym. The type specimens of the latter are smaller, darker in color and possibly somewhat more slender, in all other respects the agreement is complete.

A. septentrionalis, Lec.

This is a somewhat more slender form than those which precede. It differs notably by the absence of the oval finely-punctured space on the prosternum and in lieu thereof a broad but feeble channel extending from the tip of the prosternum nearly to the apical margin. The same is seen in the female but to a much less marked extent.

A. Putzeysii, n. sp.—Oblong oval, piceous, surface feebly bronzed. Head smooth, frontal impressions moderate. Antennæ pale rufous. Thorax one-half broader than long, apex very feebly emarginate, anterior angles broadly rounded, sides moderately arcuate in front, slightly sinuous and feebly narrowed to the base, hind angles rectangular and slightly prominent, base truncate, basal impressions deep, the outer limited by an obtuse carina extending one-fourth the length of thorax, inner impression rounded, disc of thorax moderately convex, median line moderately impressed, surface smooth, basal third coarsely punctured, punctures sparser at middle. Elytra oval, slightly broader than the thorax, surface moderately deeply striate, (less deeply at apex) striæ crenato-punctate, punctures gradually finer and more distant toward apex. Scutellar stria long. Intervals flat. Body beneath and legs piceous, shining. Pro-, meso- and metasterna at sides, also the parapleurae of the sterna, coarsely punctured. Abdomen moderately coarsely punctured at the sides especially segments one and two. Length .32 inch; 8 mm.

One specimen, ♂, sent by Mr. Putzeys to Dr. Leconte, labelled St. Pierre Miquelon, (Newfoundland.)

The characters given in the synoptic table will enable this species to be readily recognized.

I take great pleasure in affixing to this species the name of an entomologist whose labors have always produced good results and whose kind reception and instruction will long be remembered by myself.

ANISODACTYLUS, Dej.

The large black Anisodactyli so abundant in California and Oregon have been deemed troublesome to distinguish and all cabinets appear to be in confusion on the subject. They appear to be separable by well defined and easily seen characters. The following table is the result of their study:

Intercoxal process and middle of second and third abdominal segments punctured; punctures with short setæ. Metasternum in front and behind punctured.
    Thorax feebly narrowed posteriorly, basal impressions very feeble, surface entirely punctured..**semipunctatus.**
Intercoxal process and metasternum smooth.
    Thorax with broad but very shallow basal impression; elytra broad, sides very distinctly arcuate..**consobrinus.**
    Thorax with rather deep linear basal impression, surface of prothorax much less densely punctured than either of the preceding species.
californicus.

Synonymy and Bibliography.

A. semipunctatus Lec. Proc. Acad. 1859, p. 83.
  A. similis Lec. Ann. Lyc. V., p. 183.
  A. puncticollis Chaud. Rev. Mag. Zool. 1868, p. 11.

A. consobrinus Lec. Ann. Lyc. V., p. 183.
  A. brevicollis Lec. loc. cit.

A. californicus ♀ Dej. Spec. IV., p. 148; Lec. Ann. Lyc. V., p. 183.
  A. confusus ♂ Lec. loc. cit.

I have adopted the name *semipunctatus* for the first species, although the name *similis* has priority, for the reason that the latter applies not to the mass of specimens obtained but rather to a very rare variety, distinguished only by its slightly narrower form.

The males of the three species have the terminal dorsal segment coarsely punctured, while in the females the punctures are nearly obliterated and the surface comparatively smooth.

PATROBUS Dej.

The species of this genus appear to have been unnecessarily multiplied. Having lately had occasion to examine them closely the following table has been prepared. Typical specimens of all the species are before me with two exceptions *fulvus* and *angusticollis* Mann. which still remain unknown.

Disc of thorax convex, hind angles with a rather deep fossa; head behind the eyes constricted.
  Last two joints of maxillary palpi equal....................**longicornis** Say.
  Last two joints unequal, terminal longer..................**septentrionis** Dej.
Disc of thorax flat, sub-quadrate, hind angles depressed without fossa; head not or very feebly constricted behind the eyes; terminal joints of maxillary palpi equal.
  Hind trochanter ♂ one-third the length of the thigh and not differing from that of the female..**rugicollis** Rand.
  Hind trochanter ♂ nearly half the length of the thigh and acute at tip, that of the ♀ normal..**aterrimus** Esch.
  Hind trochanter ♂ nearly as long as the thigh, at tip slender and very acute, that of the ♀ scarcely differing from the ♀ ♀ of the two preceding...**californicus** Motsch.

P. longicornis Say, *americanus* Dej.

Pennsylvania to Missouri and northward.

P. septentrionis Dej., *hyperboreus* Dej., *fossifrons* Esch., *foveicollis* Esch., *longiventris* Mann., *tenuis* Lec., *rufipes* Lec.

Europe and Arctic America.

P. rugicollis Rand., (*angicollis* misprint).

Pennsylvania, North Eastern States and northward.

P. aterrimus Esch., *fulcratus* Lec.

Colorado and North West to Alaska.

P. californicus Motsch., *trochantericus* Lec.

In this species the ♂ hind tibiæ are distinctly arcuate at basal third. Northern California.

The two unknown to us (*fulvus*, *angusticollis*) should also doubtless be referred to the same species with the other Arctic forms of Mannerheim and Eschscholtz.

The last three species in the above table have a tolerably close superficial resemblance. The thorax is rather narrower behind in *rugicollis* and nearly square in *californicus*. While noticing the remarkable differences existing between the males it is well to recall a similar difference existing between two species of Pterostichus, *rostratus* Newm., and *grandiceps* Chaud., (nec Leconte). As seen from above no differences whatever exist, while the latter has the hind trochanter long and slender almost precisely as in *Patrobus californicus*. Similar differences between otherwise closely allied species may exist in other places in the Carabideous series and these two instances are specially noticed here together that attention may be directed to further observation.

TRECHUS Clairv.

Three forms occur in this genus, the first with oblong elytra which are nearly twice as wide as long and with five or six striæ moderately well impressed; the second with oblong oval elytra with distinct humeri and four or at most five striæ, the inner three moderately well and the outer two very feebly impressed; the third has broadly oval elytra the striæ nearly obsolete sometimes with the two nearest the suture feebly distinct.

The following are the species.

T. rubens Fab., elytra oblong.—Occurs in Northern Europe and Nova Scotia.

T. chalybæus Mann., elytra oblong oval.—Occurs in Alaska.

T. californicus Motsch., does not differ from the preceding.—Alaska, California, Oregon.

T. micans Lec., I can see no difference excepting a somewhat paler color; *fulvus* Lec., is immature.—New Hampshire and Lake Superior.

T. ovipennis Motsch., elytra broadly oval.—Alaska.

T. lævigatus Lec., does not differ from *ovipennis*.—California and Oregon.

BEMBIDIUM, Latr.

B. Wingatei Bland, Proc. Am. Ent. Soc. 1864, p. 319 is *oblongulum* Mann. This species originally described from Alaska occurs in Canada, Michigan and Pennsylvania. It has been referred to *Trechus* by Chaudoir, but the external maxillary lobe is formed exactly as in *Amerizus* and the species should therefore be placed in that genus. *Amerizus spectabilis* Mann., is well known to American students.

TACHYS, Zieg.

The following synonyms have been observed:

T. oopterus Chaud. is *ventricosus* Lec.—Type from Chaudoir.
T. rivularis Mann. is *nanus* Gyll.—Type from Mannerheim.
T. occultus Lec. is *granarius* Dej.—Type from Chaudoir.

Dysmathes Sahlbergi Mann. A specimen of *Amphizoa insolens* Lec., was sent by me to Mäklin for comparison with Dysmathes, and by letter from M. Sallé learn that they have been pronounced identical, as I had suspected and have already published.

Tanyrhinus singularis Mann. This insect has also caused trouble since the day of its publication. Mannerheim placed it near *Rhinosimus*, etc., notwithstanding its pentamerous tarsi. An admirable figure kindly sent by Mäklin seems to show that it is a Staphylinide! of the Omalium group and Dr. Leconte suspects may be allied to *Trigonodemus* Lec.

ENDOMYCHIDÆ.

In a small pamphlet entitled "Endomycici Recitati" published in London, (bearing date May, 1873, but not issued until September, 1873), by Rev. Mr. Gorham, the following North American species are described.

Rhymbus minutus Gorham, l. c., p. 56, is *Alexia minor* Crotch, Trans. Am. Ent. Soc., May, 1873. The species is certainly a *Rhymbus* and not an *Alexia*, and both *minor* and *Ulkei* Crotch, must be placed under the former generic name.

Aphorista humeralis Gorham, loc. cit. p. 45, is a perfect reproduction of the type of *Mycetina morosa* Lec. For this species as well as *læta* Lec., Mr. Gorham has erected a new genus as above indicated, the characters of which seem entirely too trivial to be considered valid.

SCAPHIDIIDÆ.

SCAPHIDIUM, Ol.

The four species indicated in our lists appear to be merely varieties of one, and are separable as varieties in the following manner:

Elytra with two red spots on each.
  Elytra with three short rows of large punctures......**quadriguttatum.**
  Elytra with two short rows of large punctures..................*quadripunctatum.*
  Elytra without rows of punctures..*obliteratum.*
Elytra black without spots...*piceum.*

Varieties of the latter form also occur parallel with those of the spotted form and should these differences be considered valid two more species must be indicated I prefer to consider all as variations of one form.

NITIDULIDÆ.

IPS, Fab.

Our species formerly known under the name *Ips* have been placed under the more recent name *Pityophagus* in the "Check List." Without desiring at this time to discuss the vexed question of priority and the correctness of the use of the name *Ips* by Fabricius, it has seemed to me desirable to place before the American students a condensed review of our species.

I cannot agree with the author of the "Check List" and with Reitter (Verhand. des Naturf. Vereines in Brünn XII.), in uniting all the species under one generic name, believing that the general form, the structure of the head and the eyes distant from the thorax are characters of generic value.

Ips.—Body oblong oval, depressed; head broader than long, deeply inserted in thorax, eyes close to the angles of thorax. Elytra without sutural stria.

Pityophagus.—Body sub-cylindrical; head nearly as long as broad, prolonged behind the eyes which are distant from the thorax. Elytra with sutural stria.

Our species of Ips are as follows:

Hind tarsi nearly as broadly dilated as the anterior, thorax broader at base than apex..Sub-Gen. IPS.
Hind tarsi slender not dilated, thorax narrower at base than apex. Sub-Gen. GLISCHROCHILUS.

Sub-Genus *Ips*.

Middle and hind tibiæ ♂ with the lower half suddenly broader.
  Body black, elytra each with two large red spots........................**obtusus.**
Middle and hind tibiæ not broader, similar in the sexes.
  Body beneath black..**fasciatus.**
  Metasternum, abdomen and pygidium red................**sanguinolentus.**

Sub-Genus *Glischrochilus*.

Sides of thorax distinctly sinuate in front of hind angles.
  Elytra reddish yellow, apical fourth, margin and humeri black; at middle a round black spot joining the margin, base of suture and a small round spot on each side black..**confluentus.**
  Elytra black with pale linear spots, one basal, one ante-median and two side by side post-median..**vittatus.**
Sides of thorax gradually narrowed to base not sinuate. Form elongate, legs rufo-piceous; elytra black with a moderately large sub-humeral red spot and a median interrupted fascia..**cylindricus.**

I. obtusus Say. Bost. Journ. I., p. 168.

Very little variation occurs in ornamentation, which consists of two large red spots on each elytron, one slightly within the humeral angles the other post-median. Length .36.—48 inch; 9—12 mm.

Occurs in the Middle and Southern Atlantic States.

I. fasciatus Ol. Ent. II., 12, p. 7; pl. 2, fig. 13; Say., loc. cit., p. 169; *quadrisignatus*, Say., loc. cit., p. 169; *bipustulatus*, Mels. Proc. Acad. II., p. 108; *sexpustulatus*, Reitter, Verhand. Naturf. vereines in Brünn XII., p. 161.

These are all varieties of one species, the characteristic names given the varieties will enable them to be determined readily. Reitter says (loc. cit. note) that *sexpustulatus* and *quadrisignatus* have four quadrangularly placed impressions on the front while *fasciatus* has but two. In the majority of all the forms before me there are no impressions whatever. Length .16—.28 inch; 4—7 mm.

Occurs over the entire region east of the Rocky Mountains and also in Vancouver.

I. sanguinolentus Ol. Ent. II., 12, p. 8; pl. 2, fig. 14; Say., loc. cit.; *rubromaculatus*, Reitter, loc. cit., p. 161.

The elytra are red broadly tipped with black, humeri and a median round spot black. This is the normal coloration. In the form described by Reitter, the median black spot is extended so that the red is reduced to a short basal fascia with another post-median narrow fascia interrupted at middle. We have in our cabinets enough of the intermediate forms to show the identity of the two. Length .18—.24 inch; 4.5—6 mm.

Occurs from Canada to Florida and Texas.

I. confluentus Say., Journ. Acad. III., p. 195.

The elytra are more coarsely punctured than in any other of our species. The coloration has been already noticed. Length .18—.20 inch; 4.5—5 mm.

Occurs from Canada to Georgia.

I. vittatus Say., Bost. Journ., I., p. 170; *dejeani*, Kby., Fauna Bor. Amer. IV., p. 107; pl. 2, fig. 4; *sepulchralis*, Rand., Bost. Journ., II., p. 19.

The sides of the elytra are nearly exactly parallel. The elytra are more coarsely punctured than any species except the preceding. Length .16—.20 inch; 4—5 mm.

Occurs in Canada, Utah and Oregon.

I. cylindricus Lec. New Species, 1863, p. 64.

Form more elongate than *vittatus* and more convex. The thorax is slightly broader than long, the sides absolutely straight and gradually converging to the basal angles which are sharply rectangular. The coloration has already been noted. Length .26—.30 inch; 6.5—7.5 mm.

Occurs in California, Oregon and Nevada.

I might here notice a curious paragraph in Reitter's paper (p. 166).

After describing a new genus *Ipsimorpha*, founded on a Mexican species (*striatopunctata*), he adds a paragraph which I here translate:

> "I should have considered this species, *Rhizophagus* (*Ips*) *cylindricus*, *Lec.*, did not the diagnosis read as follows: '*thorace paulo angustiore, latitudine fere sesqui longiore, lateribus rectis, angulis posticis rotundatis.*' The striate punctate elytra lead me to suppose that this species should also be referred to *Ipsimorpha*."

The *Rhizophagus cylindricus* Lec, and *Ips cylindricus* Lec., are two very distinct insects and differ especially in the form of the anterior coxæ and the number of antennal joints, and belong to two distinct families, It is very likely that Reitter has never seen the description of the latter species.

PITYOPHAGUS, Schuck.

Two species occur in our fauna.

P. cephalotes Lec. Proc. Acad., 1860, p. 377. Color rufous, elytra piceous. Length .20 inch; 5 mm.

Occurs in Pennsylvania.

P. rufipennis Horn, Trans. Am. Ent. Soc., 1872, p. 146. Body black, legs piceous, elytra brownish red. Length .28 inch; 7 mm.

Occurs in Oregon and Vancouver.

All the specimens before me have the tip of the pygidium furnished with a reflexed margin. This may be sexual.

Carpophilus rufus Murr. From my series I am convinced that this species is *melanopterus* Er.

DERMESTIDÆ.

PERIMEGATOMA, n. g.

This genus is suggested for several species occurring from Lake Superior to Texas, California and Sitka, which agree with *Megatoma* in all of its characters except in the antennal fossæ. In the present genus there are no antennal fossæ whatever. The ornamentation, by pubescence of the surface, resembles somewhat that of *Megatoma*, there being two transverse undulating cinereous bands, the one at basal third the other at apical fourth.

The following table will enable our species to be readily distinguished:

Antennal club three-jointed.
  First joint of club, in both sexes, very little smaller than the second joint.
    Pubescence uncolored, greyish-white, (.16 inch)........... **cylindricum.**
    Pubescence bi-colored, (.20 inch)................................... **variegatum.**
  First joint of club extremely short.
    Pubescence bi-colored, (.14 inch).. **falsum.**
Antennal club five-jointed.
    Pubescence bi-colored........................... .... **Belfragei.**

P. cylindricum Kby., Fauna Bor. Am. IV., p. 113; pl. 7, fig. 3: *angularis*, Mann., Bull. Mosc., 1853, III., p. 216.—Form oblong oval, piceous, shining, thorax densely punctured, elytra less densely punctured, surface sparsely clothed with greyish-white recumbent pubescence, very easily removed. Length .13—.16 inch; 3½—4 mm.

Male.—Club of antennæ longer than the funicle, terminal joint longer than the other two together and pointed at tip.

There is a duplicate of Kirby's type before me. The elytra are piceous, but near the posterior third may be seen the evidences of a paler transverse band.

To this species I refer certain female specimens brought by Mr. Crotch from the Sierra Nevada Mountains of California, which vary somewhat in appearance.

Specimen *a*, uniformly piceous, pubescence normal, slightly denser at the sides of the thorax (*angularis*, Mann.)

Specimen *b*, similar to *a*, but with the pubescence adhering more closely and forming a very indistinct sinuous band at basal and apical third.

Specimen *c*, elytra with a sinuous transverse rufo-piceous band at apical and basal third to which the pubescence is very closely adherent causing the elytra to be conspicuously marked.

The distribution of the species is very wide, from Sitkha (Mann.), Saskatchewan (Kirby), Lake Tahoe and Tejon, Cal. (Crotch), Oregon (Horn).

P. falsum, n. sp.

This species resembles exactly in their form and vestiture those described as variety *c*, above. The only differences are found in the structure of the antennal club.

Male.—Club of antennæ slightly longer than the funicle, first joint extremely short but nearly as wide as the second, terminal joint more than twice as long as the two following together and pointed at tip.

Female.—Club not longer than the funicle, first joint much shorter than the second, terminal joint slightly longer than the first two united and but little longer than wide, oval at tip.

The pubescence of the elytra is decidedly bi-colored, being composed of pale-brownish and greyish-white hairs intermixed, the former forming narrow transverse bands in front of the rufous bands of the elytra. Length .14 inch; 3½ mm.

Occurs at Tejon and Santa Barbara, Cal., (Crotch).

P. variegatum, n. sp.—Oblong oval, piceous or piceo-rufous, elytra with two sinuous transverse bands of rufous with dense white pubescence. Head and thorax densely punctured, covered with intermixed pale-brown and white hairs. Elytra oblong oval, sides sub-parallel, surface less densely punctured than the thorax, color piceous with a sinuous rufous band at basal, and another at apical third, rather densely covered with white pubescence, the remainder of the surface with intermixed pale-brown and whitish hairs. Body beneath densely punctured, sparsely covered with cinereous hairs. Antennæ rufous or pale-brown. Length .20—.22 inch; 5—5.5 mm.

The specimens before me are apparently all females. The antennal club not longer than the funicle, the first two joints nearly equal and the terminal shorter than the other two united, oval and slightly obliquely truncate on the inner side.

Three specimens, San Diego, (Crotch), Oregon, (Horn).

P. Belfragei, Lec., (*Trogoderma*), Trans. Am. Ent. Soc., 1874, p. 49.

This species is similar in ornamentation to the preceding, but of more elongate form. Length .22 inch; 5.5 mm.

Occurs in Texas.

LUCANIDÆ.

LUCANUS, Linn.

Lucanus placidus Say., is thought by Major Parry to have been described from the female of *elaphus*, and he would therefore place the name *lentus* Cast., to that form occurring in the Southern and Western States to which the name *placidus* has been attached by American Entomologists. A comparison of the descriptions of Say and Castelnau, leave no doubt in my mind that both are applicable to precisely the same species, and should the views of Major Parry be adopted, our so-called *placidus* must be nameless. I cannot, however, agree with this view, and have no doubt whatever that the descriptions by Say and Castelnau, apply to the same species which is that now known as *placidus* by us. This name should therefore remain.

Platycerus cœrulescens Lec., was previously described as *oregonensis* Westwood.

SCARABÆIDÆ.

Chœridium Lecontei Harold, appears in the Check List as a synonym of *histeroides*. This is incorrect. The former has the hind thoracic angles very much more broadly rounded and the margin at the angle very feeble and not at all reflexed as in the latter. It occurs in the Southern States.

ONTHOPHAGUS, Latr.

The species of *Onthophagus* are few in number in our fauna, and a careful examination convinces me that the number already given in our lists must be reduced, several having been described from variations in color and the degree of prothoracic development in the male. The species divide themselves into two sections.

Thorax of male protuberant in front, frequently with a long process more or less deeply emarginate at tip...Section A.
Thorax of male not differing from the female, both simply convex....Section B.

In the *first section*, evidences of a tendency to a protuberance of the thorax in front, are distinctly visible in the female. When a slight protuberance does not exist in the female there are on the anterior margin of the thorax two slight depressions visible, one on each side midway between the median line and the anterior angle. The prothoracic protuberance of the male varies greatly in development. In its greatest size the process forms a plate of variable width, usually much longer than wide projecting three-fourths as far as the tip of the clypeus, more or less deeply emarginate at tip and with the angles thus formed divergent. In *Hecate* a slight process projects downwards from the bottom of the emargination and is itself deeply notched forming two small teeth, while in *Janus* a slight tooth is seen near the tip of the diverging angles. From the size above described, the prothoracic process may be reduced to a mere transverse tubercle. The males of all the species have much longer, more slender and more arcuate anterior tibiæ than the females and the terminal spur is shorter, more robust and more arcuate.

In the *second section* the form of the anterior tibiæ furnishes the only guide for distinguishing the sexes.

In nearly all the species the head is transversely bicarinate in the two sexes, and where the thoracic protuberance is strongly marked in the male these carinæ disappear and in very nearly all the females of all the species the carinæ are more strongly marked than in the males. These two carinæ are situated, the anterior on the clypeo-frontal suture, the posterior on the vertex between the eyes.

The first section contains three species.

Body black, opaque, thorax finely granulate, elytra finely chagrined and with two rows of fine granules on each interspace. Vertical carina of male simple..**Hecate.**

Body bronzed or greenish, shining, thorax punctured, elytra usually shining not granulate. Vertical carina of male elevated at each extremity into a horn of variable size or an acute tubercle..**Janus.**

Body black, sub-opaque, thorax sparsely punctured; elytra very finely chagrined and irregularly biseriately punctured. Vertical carina of male elevated at each extremity into a long slender horn......................................**velutinus.**

O. Hecate Panz., *hastator* Fab., *latebrosus* Fab., *obtectus* Beauv., *Sayi* Cast.—Black, opaque, sparsely clothed with short greyish hair. Thorax moderately densely granulate, median line at base very finely impressed. Elytra finely striate, intervals finely chagrined and with two or three rows of fine granules. Pygidium coarsely punctured, at base opaque and granulate. Body beneath shining, coarsely but sparsely punctured. Length .34 inch; 9 mm.

Male.—Margin of head moderately reflexed, in front elevated in a slender triangular process, on each side slightly sinuate. Clypeus smooth at middle, punctured and wrinkled at the sides, front and vertex very sparsely punctate. Clypeal carina feeble or absent, vertical carina arcuate and feeble, frequently entirely absent. Prothoracic process broader at tip and emarginate and with a feeble bidentate process from the middle of the emargination.

Female.—Anterior margin of clypeus without the slender process; surface of clypeus coarsely punctured and transversely wrinkled. Clypeal carina strong nearly attaining the side margin of the head, vertical carina more elevated curved backwards at its ends. Prothorax slightly protuberant at middle or with a slight depression on each side of the middle of the anterior margin.

This species occurs abundantly over the entire region east of the Rocky Mountains and varies in its development about equally in all parts of that territory. Its size varies from .34 to .20 inch, and at the same time no varieties occur requiring special remark beyond the generalities already given.

O. Janus Panz., *Orpheus* Panz., *canadensis* Fab., *striatulus* Beauv., *subæneus* Beauv.. *scabricollis* Kby., *concinnus* Cast., *castaneus* Mels., *cervicornis* Kby., *protensus* Mels., *niger* Mels.—Color variable, bronzed, greenish or cupreous, shining, surface sparsely pubescent. Thorax sparsely and coarsely punctured, anteriorly with a tendency to granulation. Elytra finely striate bi- or triseriately punctate. Pygidium sparsely punctured, more densely and coarsely near the apex. Body beneath greenish or bronzed, sparsely punctured. Length .30—.16 inch; 7.5—4 mm.

Var. **Orpheus** Panz., *canadensis* Fab., etc.—Surface metallic green or bright bronze, shining. Thorax sparsely and moderately coarsely punctured.

Male.—Clypeal margin moderately reflexed, at middle slightly elevated and subtruncate, surface of clypeus sparsely punctured. Clypeal carina nearly obliterated. Vertical carina feeble at middle, elevated at each end in an acute tubercle. Prothoracic process broader at tip deeply emarginate, angle divergent and with a small tooth like process near the tip.

Var. **subæneus** Beauv.—Thorax and elytra metallic green, the latter at base and apex yellowish, the former slightly granulated anteriorly.

Male.—Clypeal margin at middle slightly elevated and not truncate. Vertical carina at its ends elevated in a short horn. Thoracic process short broadly emarginate at middle.

Var. **striatulus** Beauv., *castaneus* Mels., *scabricollis* Kby. — Piceous or piceotestaceous, surface bronzed. Elytra paler at base and apex.

Male.—Clypeus as in *Orpheus*. Vertical carina at extremities elevated into a slender horn nearly as long as the height of the thorax. Thoracic protuberance very small.

The females of all the above varieties agree in having the clypeus deeply punctured and transversely wrinkled, the clypeal carina strong and attaining the side margin of the head, the vertical carina still stronger and slightly arcuate or sinuate. The head of this species in form agrees with the preceding and has a similar sinuation on each side at the end of the clypeo-frontal suture.

This species is widely diffused and varies so much in color and in the degree of the development of the various peculiarities of the male as to have caused it to have been described under so many different names. It will be seen however that, as in *Hecate*, as the thoracic protuberance is developed the cephalic carinæ and horns become reduced to a minimum, while in the last variety in which the protuberance is scarcely larger than in the female, the vertical carina at its extremities becomes elevated into two long slender horns.

Occurs over the same extent of country with the preceding species.

O. velutinus, n. sp.—Black, subopaque, punctures bearing very short setæ. Thorax sparsely punctured, between the punctures extremely finely chagrined. Elytra with sides regularly arcuate not narrowing posteriorly, surface very finely striate, striæ very distantly punctured, intervals finely chagrined and irregularly biseriately punctulate. Pygidium opaque very sparsely punctured. Body beneath very sparsely but rather coarsely punctured. Length .30 inch; 7.5 mm.

Male.—Clypeus nearly semicircular with a broad feeble emargination at middle, surface coarsely punctured. Clypeal carina very feeble. Vertex sparsely punctured, carina very feeble at middle, each end elevated into a moderately long slender horn. Thorax slightly protuberant in front. Anterior tibial spur strongly recurved.

Female.—Unknown.

This species recalls some of the varieties of the preceding but its entire aspect is different. Its form is somewhat longer and the elytra have regularly arcuate sides so that their form is nearly circular with the emargination at base. It is probable that further collections may produce forms in which the development more nearly approaches that of the preceding species.

Occurs in Lower California and Arizona.

The second section contains those species without any trace of prothoracic protuberance. The males are known by the form of the anterior tibiæ and by the smoother head. Two species only are known.

Margin of clypeus at middle acutely notched.................. **tuberculifrons.**
Margin of clypeus very feebly truncate at middle............. **pensylvanicus.**

O. tuberculifrons Harold, Coleopterologische Hefte VIII., p. 115; *tuberculatus* Zimm., mscpt.—Black, subopaque, surface feebly bronzed and very sparsely pubescent. Clypeus acutely notched at middle. Thorax finely chagrined, sparsely punctato-granose. Elytra finely striate, surface finely chagrined, intervals biseriately punctate, punctures alternately placed and each bearing a short hair; base and apex with small paler patches. Body beneath piceous sparsely punctate; legs paler. Pygidium sparsely punctate. Length .14—.20 inch; 3.5—5 mm.

The sexes of this species do not greatly differ. The margin of the head is moderately reflexed, acutely notched at the middle of the clypeus, the latter more coarsely punctured in the female. The clypeal carina is short in the female and very nearly obliterated in the male; the vertical carina is also short divided at middle and forming thus two small tubercles. The species may be at once known by the notched clypeus.

Occurs from the Middle States to Florida, where it is very abundant.

O. pensylvanicus Harold, Coleopterologische Hefte VIII., p. 115; *ovatus* ‡ List Col. N. A.; *granarius* Zimm., mscpt.—Black, feebly shining, very sparsely pubescent. Clypeus entire or feebly truncate at middle. Thorax moderately, not densely punctate. Elytra finely striate, intervals biseriately punctate, punctures alternating. Body beneath piceous, shining, sparsely punctate. Length .14—.20 inch; 3.5—5 mm.

Male.—Front nearly flat without carinæ, with very few punctures, clypeus very sparsely punctate.

Female.—Front sparsely, clypeus rather densely and coarsely punctured. Clypeal carina moderate, feebly elevated. Vertical carina nearly obsolete.

This species has been distributed in many cabinets in our country as *ovatus* Linn., from which it differs greatly. The latter is of larger size, thorax much more coarsely and densely punctured, the clypeal carina ♀ very feeble and the vertical carina strong and considerably elevated.

Occurs rather abundantly from the Middle States to Kansas, Texas and Florida.

O. rhinoceros Mels., Proc. Acad. II., p. 134, is the European *O. nuchicornis* Linn., introduced by accident into Melsheimer's cabinet.

APHODIUS, Illig.

A. arcticus Harold is *congregatus* Mann. The color of this species is subject to great variation. *A. arcticus* has entirely black elytra and *congregatus* yellowish red or ferruginous, slightly or much clouded.

A. Steinheili Harold is *serval* Say.

DIALYTES, Harold.

D. Ulkei, n. sp.—Obovate, black, subopaque. Head shining, coarsely but sparsely punctate, clypeus broadly emarginate at middle with an acute, prominent tooth on each side. Thorax sub-cylindrical very slightly narrower in front, sides in front nearly straight, posterior third suddenly narrowing with a feeble sinuation, apex truncate base feebly lobed, disc convex, a feeble median impression near the base, surface coarsely and densely punctured on the disc, at sides confluent, basal marginal line distinct. Elytra slightly broader behind the middle, humeral angles strongly dentiform, disc convex. intervals finely costiform between which are two finer elevated lines which enclose distant punctures, these finer lines near the sides are interrupted. Body beneath subopaque sparsely punctured, legs shining more coarsely punctured. Length .24 inch; 6 mm.

Very distinct from either of our species by the denticulate clypeus and the elytral sculpture.

One specimen collected in Maryland, at Deer Park, by Mr. H. Ulke.

ATÆNIUS, Harold.

In the Coleopterologische Hefte XII., Munich, 1874, Baron Harold describes as new several North American species of Ataenius of the group with toothed clypeus, without being aware that a paper including all the species of this genus had already been published in the Trans. Am. Ent. Soc., 1871, p. 284—289. Having lately had an opportunity of examining the types of Harold, the following is the result:

At. attenuator Harold, Hefte XII., p. 22, is *abditus* Hald.

At. texanus Harold, l. c., p. 23, although possibly a true species, differs from *abditus* in the manner that southern varieties of the latter differ from the northern. I would prefer calling it merely a variety.

At. Lecontei Harold, l. c., p. 20, is certainly identical with *ovatulus* Horn. The latter was, however, described from a slightly worn specimen and the clypeal teeth were entirely removed and a renewed examination shows that *cylindrus* Horn, is the perfect form, and the latter name should therefore be substituted.

At. Horni Harold, l. c., p. 19, is somewhat more cylindrical in the form of the elytra but does not otherwise differ. The specimen from which the species was described is unique in the cabinet of Baron Harold, and with the examination made of it did not appear to differ specifically from the preceding.

The following without toothed clypeus are described.

At. socialis Harold, Bert. Zertschr., 1873, p. 174, is *socialis* Horn, 1871.

At. figurator Harold, Hefte XII., p. 24.—A slender shining species near *gracilis* but with the punctures of the thorax coarse and widely distant. A very distinct species. Occurs in Texas.

PHYTALUS, Blanch.

Under this generic name a species (*glaberrimus* Bl.) appears in the Check List. On his return from Europe, Dr. Leconte brought a specimen said by the donor to be *Lachnosterna glaberrima* Blanch., which proved on examination to be a *Phytalus* and the species to which the name *L. glaberrima* was attached in our cabinets was therefore supposed to be erroneously determined, and Mr. Crotch substituted the name *glabra* for that which it bore. A comparison made by myself shows that the original determination was correct, and that the specimen given to Dr. Leconte although closely resembling *glaberrima* was not that species. *Phytalus glaberrimus* must be stricken from the list and the name *glaberrina* restored to its original position.

The genus *Phytalus* has however representatives within our fauna, one of moderate size resembling *Lach. Burmeisteri* and one smaller resembling *L. inana*, the former from New Mexico and the latter from Texas.

These species I hope to make known with a general revision of the Lachnosternæ.

LACHNOSTERNA, Hope.

The following synonyms have been detected:

L. sororia Lec. is *rufiola* Lec. The antennæ are nine-jointed in both forms.

L. robusta Lec. is *crassissima* Bl. The synonymy of *obesa* with the latter has already been noticed. I find *robusta* to have the antennæ distinctly ten-jointed agreeing with *crassissima* in this and all other characters.

CYCLOCEPHALA, Latr.

C. elegans Horn, is identical with *dimidiata* Burm.

LIGYRUS, Burm.

Three species of this genus have been separated on the dentation of the galea of the mandible, *morio*, *gibbosus* and *juvencus*. I have seen very good series of these species and, although some variation does occur in the distinctness of the outer tooth, from age and wearing, it appears to me that the three should be united under one name (*gibbosus*) as specifically identical.

Our species separate easily in the following manner:

Thorax impressed in front and with a small tubercle. Anterior tibiæ tridentate.
  Clypeus bidentate..**gibbosus.**
  Clypeus unidentate...**ruginasus.**
Thorax not impressed nor tuberculate. Anterior tibiæ subquadridentate.
  Larger species, brownish or piceous; mesothorax hairy. ....**relictus.**
  Smaller species, black; body beneath not hairy......................**rugiceps.**

STRATEGUS, Hope.

Within our faunal limits are five species and while well known and easily distinguished by those having all the species, it is not an easy matter for others to name with certainty any of them excepting well marked males of *Antæus* or *Julianus*. The following study is presented to remedy the difficulty.

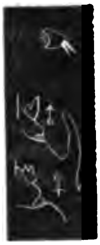
Elytra with sutural stria visible, at most, for a short distance from the tip. **Antæus.**
Elytra with entire sutural stria.
  Sexes differing in form of thorax...**Julianus.**
  Sexes not differing in the form of thorax.
    Galea of mandible with a long slender median tooth.................**Mormon.**
    Galea without slender tooth.
      Galea differing in the two sexes..**splendens.**
      Galea similar in the two sexes...**cessus.**

The most striking sexual character is found in the different armature of the thorax of the male. This however occurs in the first two species only. The clypeus of the male is usually truncate and that of the female acute, or at least more so than the male. The only constant and invariable character is found in the pygidium. This organ in the male is always regularly convex, in the female broadly transversely impressed and much smoother in the impressed space than the corresponding portion in the other sex. The anterior spur of the middle and hind tibiæ is sometimes stouter in the male than the female, although the difference is neither very obvious nor important.

S. Antæus Fab., *Maimon* Fab.

General characters.—Form broadly oval, piceous or dark castaneous, shining. Elytra with sutural stria visible only at apex. Outer angle of the tip of the middle and hind tibiæ simply emarginate and with unequal spinules.

Male.—Thorax with three horns, one from the middle of the anterior margin of the thorax, directed forward and upward, and one from each side behind the middle directed inward and slightly backward, of more robust form than the anterior horn. A moderately deep fossa on each side between the bases of the anterior and middle horns. Clypeus oval, subtruncate at tip, front with two slight tubercles. Galea of mandibles tridentate, inner and outer teeth very feeble, middle tooth long slender and subacute.



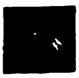
Female.—Thorax with an obtuse tooth at middle of anterior margin, behind which is a moderately deep fossa of somewhat crescentic form, transversely wrinkled. Clypeus similar in form to that of the male. Galea of mandibles tridentate, inner two teeth similar and equal, outer broader and less prominent.

This species may be distinguished from all the others by the absence of the sutural stria. I have, however, seen one specimen in the cabinet of Mr Ulke with a very faint stria. The thoracic processes of the male become at times very short.

Occurs from New Jersey to Texas.

S. Julianus Burm.

General characters.—Form oblong oval, piceous or castaneous, thorax and head always darker than the elytra. Sutural stria entire and moderately deep. Outer angle of the tip of the posterior tibiæ distinctly tridentate and with one or two spinules only on each side of the middle tooth.



Male.—Thorax with a moderate horn from the middle of the anterior margin, and one on each side broad and laminiform obliquely truncate or rounded at tip and crenulate; a deep fossa on each side as in *Antæus.* Clypeus broadly emarginate and slightly reflexed at tip, front bituberculate. Galea of mandibles laminiform, truncate in front with a slight notch and a slight sinuation externally.

Female.—Thorax with slight tubercle at middle of anterior margin with an antemedian, oval, moderately deep fossa. Clypeus oval and truncate at tip Galea of mandibles resembling that of the male with the outer tooth in form of an obtuse lobe.

In both sexes the thoracic fossæ, as well as a narrow space along the basal margin, are transversely wrinkled. The thoracic processes of the male become greatly reduced in many specimens so that the form of the female is approached, but however much the posterior horns are reduced, the anterior is always moderately prominent and more so than in any female. The form of the thorax resembles the preceding species in having the sides very strongly arcuate at middle and rapidly narrowing at apical half.

This species occurs from Georgia to Mexico.

S. splendens Beauv.

General characters.—Form oval, narrower in front, color uniform, castaneous. Elytra with distinct sutural stria. Outer angle of the tip of hind tibia deeply notched, with very slight trace of tooth in the notch and two spinules only.

Male.—Thorax with a short process from the middle of the anterior margin, very broad at base, behind which is a shallow oval impression. Clypeus truncate at tip and feebly reflexed, front with feeble tubercles. Galea of mandibles with the middle tooth prominent but broad and obtuse at tip, inner tooth very short, outer scarcely evident. Anterior spur of middle tibia conspicuously stouter and broader than in the female.

Female.—Thorax with feeble trace of tubercle near the anterior margin and a very shallow impression. Clypeus less distinctly truncate at tip. Galea of mandibles with the inner two teeth similar and equal, outer in the form of a slight lobe.

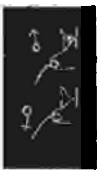
This species is a little less robust than *Antæus* and narrower anteriorly. The only difficulty which might arise with the present species is in the separation of its males from the females of the preceding.

Here reliance must be placed primarily in the form of the galea of the mandible and secondarily in the form of thorax. The bead along the basal margin of the thorax is here very feebly and in *Julianus* very well developed.

This species occurs in Georgia and Florida, and is not common.

S. Mormon Burm.

General characters.— Body oval, slightly narrower in front, color castaneous. Sutural stria entire, deep. Hind tibiæ as in *Antæus.*



Male.—Thorax with a very small tubercle notched at summit, and a vague and very slight impression. Clypeus oval, tip reflexed and subacute, front not tuberculate. Galea of mandibles with the middle tooth prolonged into a slender and acute process, inner tooth obtuse and inconspicuous, outer entirely absent.

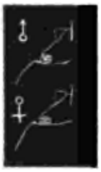
Female.—Thorax similar to the male. Clypeus very acute at tip. Galea of mandibles similarly formed but with the median tooth less prolonged.

In the prolongation of the middle tooth this species resembles the male of *Antæus,* its characters are so evident that it will not be mistaken for that or any other species.

Occurs in Kansas and Texas, very rare.

S. cessus Lec.

General characters.—Form oblong oval, slightly narrowed in front, color uniformly piceous. Sutural stria entire, elytra with more decided evidences of sculpture. Hind tibiæ as in *Antæus.*



Male.—Thorax with a feeble tubercle near the margin, behind which is a shallow oval impression. Clypeus oval, tip subtruncate and reflexed in an obtuse point. Front with feeble transverse ridge. Galea of mandibles not notched, truncate in front free angle rounded.

Female —Precisely similar to the male in every respect except in the form of the pygidium as already explained.

This species cannot be confounded with any other. The similarity of the males and females is what might be expected to occur. The sexes are barely distinguishable in *splendens,* less so in *Mormon,* and identical here.

Occurs in Arizona, rare.

One species of this genus remains as yet unsatisfactorily determined, *Scarabæus Bosci* Beauv., Ins. p. 89, pl. 2b, fig. 1. It is evidently of the size and form of *splendens* and has a similar horn at the anterior thoracic margin, but the clypeus is described as being very acute, in this respect resembling *Mormon.* I do not know that the latter species has ever occurred in the Carolinas, and suspect that the form of the clypeus is erroneously described, and if so, the synonymy is with *splendens.*

BUPRESTIDÆ.

GYASCUTUS, Lec.

G. californicus, n. sp.—Oblong, subcylindrical, gradually narrowed posteriorly, color bronze with slight æneo-cupreous lustre. Front slightly convex, densely and coarsely punctured, epistoma broadly emarginate, antennal ridges short. Antennæ shorter than the head and thorax, serrate, terminal joint obtuse at tip. Thorax slightly broader than long, cylindrical, sides slightly arcuate in front, feebly sinuate at basal half which is sub-acutely margined, hind angles sub-acute posteriorly; apex truncate, base feebly bisinuate and at middle subtruncate; disc moderately convex, coarsely and deeply but not densely punctured. Scutellum semicircular, nearly smooth. Elytra subcylindrical, parallel, gradually narrowed at apical third, margin near apex finely serrate, apex obtuse, surface densely punctured and with traces of striæ at the sides and apex. Body beneath coarsely but not densely punctured and with a few short cinereous hairs. Posterior tarsi with the first joint feebly compressed and not greatly longer than the second. Length .36—.48 inch; 9—12 mm.

Occurs in the San Joaquin Valley, California. I have seen very many specimens in the museum of the Jardin des Plantes, Paris.

This species has the form of a small *Latipalpis.* The ridges above the antennæ are much shorter than in any of our other species, and the antennal cavities approach the form seen in *Psiloptera.* The tarsi have shown already considerable variation from the very long first joint of the hinder tarsi in three of the species to that in which the first joint is barely longer than the second (*cælatus*) by which another approach is made to the *Psilopterides.* Traces of a false joint at the end of the eleventh occur in the antennæ excepting in *californicus* and *sphenicus* in which the eleventh joint is simply obtuse as in *Psiloptera.* In *Latipalpis* the last joint is abruptly truncate and the antennæ appear to have lost a joint by fracture. No very decided sexual differences occur in the three genera above named.

CHALCOPHORA, Sol.

C. Fulleri, n. sp.—Form oblong, depressed, color dark bronze feebly shining and sparsely pubescent in patches. Head coarsely punctured, deeply longitudinally grooved. Thorax broader than long, sides obtusely angulate at middle, in front oblique, behind subparallel, feebly sinuate in front of hind angles which are moderately prominent, apex feebly emarginate, base bisinuate, disc with broad vague channel at middle and a moderately deep longitudinal impression on each side, surface coarsely rugulose at the sides, smoother at middle. Elytra oblong, depressed, parallel, apical third gradually narrowed and moderately serrate, apex obtuse, surface with four vague nervures with thickened spaces which surround large but very vague fovea; nervures feebly shining intervals opaque, rugulose sparsely punctured and with very short pubescence. Body beneath similar in color to the upper surface, irregularly coarsely punctured, with spots of denser and finer punctuation. Length 1.10 inch; 28 mm.

Male.—Fifth ventral segment triangularly emarginate, sixth with large, oval, densely punctured and pubescent space surrounded by a slight elevated margin.

Female.—Fifth ventral with an oval densely punctured and pubescent cuprous space near the tip.

Two specimens are before me both of which are from Mr. A. S. Fuller, to whom I take great pleasure in dedicating the species as an evidence of my appreciation of his many acts of scientific liberality. This species belongs to the same section of the genus as *campestris* and *Langeri* but differs abundantly in the form of the thorax.

Occurs in Texas.

BUPRESTIS, Linn.

B. (Ancylochira) connexa, n. sp.—Form elongate oval, subdepressed. Head moderately densely punctured, color brilliant green changing to cupreous. Thorax broader than long narrower in front, sides very feebly arcuate, disc moderately convex with rather coarse punctures more densely placed at the sides, color brilliant cupreous. Elytra wider at base than the thorax, oblong oval, apex feebly attenuate, tip feebly emarginate, sutural angle acute, slightly prolonged, disc striate, intervals equal, moderately convex and sparsely punctured, color variable, brilliant blue along the suture shading to green with the margin cupreous. Body beneath coarsely punctured, very densely at the sides of metasternum and abdomen, color brilliant cupreous with green reflection. Prosternum and first ventral segment not sulcate. Length .60 inch; 15 mm.

This species belongs to that group in which the thorax is not sulcate with *Gibbsii*, *confluens*, etc. Its form is that of *Nuttali* while the elytral sculpture and color more nearly resemble *adjecta*.

Two specimens ♀ from Oregon and Owens' Valley, have the fifth ventral segment slightly truncate at tip, and vary in the color of the elytra. One is as above described, the other has the elytra brilliant green with the margin cupreous near the tip.

Actenodes calcarata Chev., has occurred in Texas.

ELATERIDÆ.

Meristhus texanus Horn, is *scobinula* Cand.

Corymbites præses Horn, is *Drasterius præses* Cand. This species appears to be merely a poorly developed form of *C. conjungens* Lec.

Monocrepidius vespertinus Fab., and *texanus* Cand., may be sexes of the same species.

Agriotes inversus Cand., is a *Sericosomus*, very probably *flavipennis* Motsch.

Limonius nitidicollis Lec., is *consimilis* Walker. This is probably the only species remaining valid of all those described by Walker in "Naturalist in British Columbia."

Asaphes verna ♂ Cand., is *morio* ♀ Lec.

Asaphes coracinus Cand., is *carbonatus* Lec.

The characters given by Candeze for the separation of these species appear to be those of a sexual nature. An examination of large series of *Asaphes* has shown that the females have the striæ near the suture very feeble or almost entirely obliterated, while in the males the striæ are normal. This character with the narrower thorax of the ♂ and the wider thorax of the female show the identity of the species above cited. Other synonyms on the same basis remain to be determined among the species of *Asaphes* but these must remain for a general revision.

EUCNEMIDÆ.

Entomophthalmus pallens Bonv., is *rufiolus* (Lec.)

Trigonopleurus rugulosus Bonv., is from Victoria, N. S. W., and not United States.

Schizophilus trilobatus Bonv., and *Nematodes simplex* Lec., are *Schiz. subrufus* (Rand.)

CLERIDÆ.

In the Review and Magazine of Zoology published at Paris, appears a paper entitled "*Catalogue des Clerides de la Collection de M. A. Chevrolat,*" and which evidently bears date subsequent to Sept., 1874, in which are described various North American species as new. With the assistance of Dr. Leconte, the descriptions have been compared with specimens as they stand in our cabinets with the following results:

Thanasimus melanocephalus Chev., is certainly a variety of *nubilus* Kirby.

Hydnocera funebris Chev., is *H. scabra* Lec.

Pelonium pensylvanicum Chev., is probably a variety of *Orthopleura damicornis* with oblique band behind the middle of the elytra.

Pelonium militare Chev., is *Enoplium humerale* Horn, Trans. Am. Ent. Soc., 1868, p. 135.

Pelonium lineatocolle and *filiolus* Chev., appear to be the same thing, the former is undoubtedly *Lebasiella maculicollis* Lec., Trans. Am. Ent. Soc., 1874, p. 63.

LYMEXYLIDÆ.

Hylecœtus americanus ♀ Harris, is identical with *lugubris* Say.

CERAMBYCIDÆ.

Parandra Sayi, *quadricollis*, *conformis*, *dentata* and *minuta*, Thomson, are all merely slight variations of *brunnea* Fab.

P. polita Say., occurs also in Mexico, whence it has been described by Chevrolat under the name *cylindrica*.

It may be well to mention here that two forms occur in *Parandra*, first, the long, slender, shining and depressed form, and secondly, the shorter, more robust, less shining and more convex. The former with distinct onychium and paronychia, and the latter with both so retracted as to be almost invisible. My attention was directed to the apparent absence of onychium in our common species by Mr. H. W. Bates, and subsequent examination has shown that the form of body is also an indication of the development of the onychium in any of the species.

Pilema Lec., is thought by Mr. H. W. Bates, to be identical with *Callimus* Muls. The form of the one certainly resembles very greatly the other, but having no specimen of *Callimus* with which to compare *Pilema*, the latter name must be allowed to stand, inasmuch as the best three European descriptions vary so greatly as to leave the matter in great uncertainty.

Callimus chalybæus Lec., is however *not* a *Callimus*.

Clytus nitidus Horn, is omitted from the Check List on suspicion that it might be *C. magicus*. This however is not the case, *nitidus* is a *Xylotrechus* and *magicus* a *Neoclytus*. I was moreover unable to find any species in Europe at all resembling it. The name must therefore be restored to the List.

Plagythmysus pulverulentus Motsch., is distinct from any species I have seen and appears to be a *Neoclytus*, and if so the generic name of Motschulsky has priority.

Amphidesmus xanthomelas Guerin. Specimens in the Jardin des Plantes from Lower California.

Monohammus minor Lec., is probably identical with *carolinensis* Oliv., and is doubtfully valid as a species.

Eutessus asper Lec., is *Mecotetartus antennatus* Bates. This species occurs from Lower California to Yucatan.

Pogonocherus sordidus Lec., is an *Estola* Fairm.

AMPHIONYCHA, Lec.

The first appearance of this name is in the catalogue of the collection of Dejean. Haldeman quotes the name from that author without however giving any description, (Trans. Am. Phil. Soc., 1847, p. 57), redescribing *A. marginata* Fab. The name next appears in "An attempt to classify the Longicorn Coleoptera of the part of America north of Mexico," by J. L. Leconte, M. D., Journ. Acad., 1852, p. 154, where the genus is for the first time fully described, and *A.* (*Saperda*) *flammata* Newm., the only known species described. Subsequently Mr. James Thomson (Archiv. Entom. I., p. 311), describes anew the genus giving a totally different type, *A. luctuosa* Lesel. from Brazil. Lacordaire (Genera IX., p. 890), adopts Thomson's description and type entirely ignoring any reference to Leconte. It appears that the genus was first described by Leconte with *flammata* as the type and the genus as described by Thomson and Lacordaire is an entirely different matter, and should receive another name. I would suggest that the name *Oedudes*, subsequently given by Thomson, be adopted.

CHRYSOMELIDÆ.

Megistops quadrinotata Boh. Eugen. Resa, is quoted from California. The other species are from Chili and Venezuela, and it is probable that this one is also.

BRUCHIDÆ.

Bruchus impiger Horn, is identical with *ramicornis* Boh.

TENEBRIONIDÆ.

Scotobænus Lec. My attention was called by M. Aug. Sallé, to the probable synonymy of this genus with *Centronopus* Sol., of which the type is *suppressus* Say., from Mexico. While examining the admirable collection of Heteromera of Mr. Fred. Bates, I was enabled to satisfy myself of the fact of the identity of the two, and would suggest the name *Scotobates* for the species now known as *Centronopus* ‡.

Eutomus (Dej.) Lac. There appears to be no doubt that this genus is very closely allied to if not identical with *Rhipidandrus* Lec. Chapuis has already stated that *Eutomus* is a Tenebrionide. Future investigation will, I think, show that neither belongs to the Tenebrionidæ.

MONOMMIDÆ.

Hyporhagus Lecontei Thoms. Examined the type of this species and the type of *lævipunctatus* Thoms., in the cabinet of Count Mnizech, and find them identical, the former being the male. The species is from the United States of *Columbia* and not California.

OTHNIIDÆ.

In the Rev. et Mag. Zool., 1874, M. Aug. Chevrolat describes *Othnius mexicanus* as new. This species was described by myself under the same name in the Trans. Am. Ent. Soc., 1868, p. 133.

MELOIDÆ.

Several of our not uncommon Western species have been redescribed by Duges, in the Transactions of the Natural History Society of Mexico. The synonymy has been determined and placed in the hands of M. Sallé of Paris, as belonging more properly to those dealing with the fauna of Mexico.

CORDYLOSPASTA, n. g. (*Meloidæ.*)

Body winged, metasternum moderately long, middle coxæ not covering the posterior. Elytra entire covering the abdomen but not concealing the metasternal parapleuræ. Antennæ eight-jointed, clavate not as long as the head and thorax, slightly arcuate; first joint moderately stout but short, second very short, third as long as the first, fourth to seventh gradually shorter and broader, eighth longer than the preceding three, cylindrical, obtusely pointed at tip. Tibiæ slender, each with a single, slender, moderately long spur. Tarsal claws cleft, the two portions connate, the lower portion half the length of the upper and its tip forming a slender acute tooth at the middle of the upper. Anterior femora without sericeous spot.

The form of the antennæ of this genus appears to be unique in the family. The terminal joint shows a slight tendency to segmentation at its base so that the antennæ might possibly be thought to be nine-jointed. This genus is certainly the nearest approach to the *Mylabrini* our country has yet produced and it appears to differ from that tribe only in the form of the tarsal claws and the unique tibial spurs. By these characters I would suggest its position in a group intermediate between the *Mylabrini* and *Lyttini.*

C. Fulleri, n. sp.—Black, subopaque. Head subquadrate, narrower in front, occiput truncate, hind angles rounded, surface opaque (minutely granulate) sparsely punctured. Thorax transverse, not wider than the head, nearly twice as wide as long, apex suddenly narrowed, sides feebly arcuate, base slightly emarginate at middle, margin slightly reflexed, surface sculptured as the head. Elytra nearly twice as wide as thorax and twice as long as head and thorax combined, parallel, each rounded at tip, surface opaque, scabro-reticulate. Scutellum oval at tip. Body beneath black, shining. Legs slender, moderately long, black, moderately shining.

Male.—Fifth ventral segment moderately long, nearly semicircularly emarginate, angles acute, prominent and moderately divergent. Length .22 inch; 5.5 mm.

I take great pleasure in dedicating the species to Mr. Andrew S. Fuller, as a slight evidence of my appreciation of his many kindnesses.

One specimen Nevada, from Mr. A. S. Fuller.

EPICAUTA, Fab.

E. Batesii, n. sp.—Moderately robust. Color of body and legs ferruginous, moderately densely covered above with concolorous pubescence which is on the under surface cinereous. Antennæ piceous, paler at base, filiform, joints closely approximated. Eyes moderately large and convex, rather coarsely granulated, scarcely emarginate. Head moderately densely punctured. Thorax subquadrate, as wide as long, median line distinct, surface moderately densely punctured. Elytra punctured similar to the thorax moderately densely covered with pubescence of a color similar to that of the surface, slightly paler along the suture. Body beneath darker ferruginous, the abdominal segments piceous along their hinder margins, surface somewhat more coarsely punctured than above and densely clothed with cinereous pubescence longer than that of the upper surface. Legs paler ferruginous. Length .36 inch; 9 mm.

This species by the form of the antennæ and eyes takes a place in group *A* in the revision of the genus published by me, Proc. Am. Philos. Soc., 1873, p. 95. It is rather more robust than any of the allied forms although resembling *ferruginea* and *strigosa*. It differs from all the species at present known in the group by its pale ferruginous legs. In the Florida specimens the body beneath is nearly piceous and the head darker than the thorax. No special sexual differences occur.

I take great pleasure in dedicating this species to my friend Fred. Bates, of Leicester, England, whose contributions to our knowledge of the Heteromera are so well and favorably known.

Savannah, Ga. and Florida. Two specimens given me by Mr. Bates, from the Dejean collection, bore the name *lurida*.

Meloe trichrus Pallas, Icones Ins. 100, tab. E, fig. 32. This is that variety of *Epicauta convolvuli* Mels. (Proc. Acad. 3, 53.) in which the pubescence is gray and the head red. The former specific name has many years priority and should be restored.

E. oregona, n. sp.—Black, subopaque, cinereo-pubescent. elytra with numerous denuded small spots. Head sparsely punctured, subopaque, with a smoother spot within and above the insertion of each antenna. Antennæ as long as half the body, moderately strongly flattened, gradually more slender to the tip. Thorax quadrate, narrower than the head, sides at anterior fourth arcuate and narrowing to tip, posterior three-fourths parallel, surface subopaque, sparsely and finely punctured. Elytra slightly wider behind, sparsely punctured, sparsely cinereo-pubescent with numerous small, denuded, rounded spots. Body beneath and legs more shining than above, sparsely punctured and pubescent. Length .36—.40 inch; 9—10 mm.

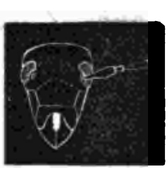
Male.—Antennæ more distinctly flattened; anterior tibiæ with two spurs; fifth abdominal segment feebly emarginate.

This species should be placed next to *cinerea* in the table given by me (Proc. Am. Phil. Soc., 1873, p. 96,) of the species of this genus. It differs from that in the maculate surface and the spurs of the hind tibiæ slender and acute while in *cinerea* the spurs are both stout and very obliquely truncate at tip. Superficially *oregona* greatly resembles some of the forms of *maculata*, but the male sexual characters at once suffice to separate it.

Several specimens collected in Oregon, by Mr. Wm. M. Gabb.

E. Alphonsii Horn, Trans. Am. Ent. Soc., 1874, p. 38, should be placed near *maura* Lec., the middle femora being similarly dilated in the male, a specimen of which was kindly given me by the late Jules Thevenet. It differs from *maura* in having the suture and margin narrowly bordered with white pubescence.

GNATHOSPASTA, n. g.



Antennæ setaceous, eleven-jointed, first joint moderate with a slight sinuation in front near the tip, second joint short, half the length of the third, these two together but little longer than the first, joints 4—11 gradually longer. Eyes elongate oval, twice as wide as long, emarginate in front. Labrum very deeply emarginate, mandibles prominent, pincer like. Labial palpi rather slender. Other characters as in *Epicauta*.

The mandibles are very much more prominent than in any vesicant in our fauna; they meet at tip and are directly opposed along a straight line and not emarginate, behind which they are slightly separated, the inner margins being feebly sinuous. The form of labrum and mandibles preeminently distinguishes the genus.

I have seen in the cabinet of the British Museum several species of very large size from China and the East Indies with this form of mandible which should probably be placed in this genus. I might here mention another curious form in the same Museum, allied to *Pyrota* but the labrum is long, rhomboidal, truncate in front, concealing the parts of the mouth beneath; mandibles stout, directly opposed, margin crenulate and with the outer face grooved. The antennæ are strongly flattened in the male and resemble those of certain Elateridæ.

The form of the first antennal joint of *Gnathospasta* points to an affinity with *Macrobasis*.

G. mimetica, n. sp.—Elongate, black, moderately densely clothed with rather coarse, recumbent, cinereous hairs. Antennæ black. Head rather large coarsely and moderately densely punctured. Thorax smaller than the head, sides at apical third rapidly converging, posteriorly gradually narrowing to base, median line feeble, disc moderately densely and coarsely punctured. Elytra at base scarcely wider than the head, gradually broader posteriorly, surface moderately densely punctulate. Body beneath and legs, moderately densely punctured and cinereo-pubescent. Length .44 inch; 11 mm.

Male.—Sixth ventral segment slightly emarginate. Metasternum concave.

One specimen, Texas. (Belfrage, No. 609). Resembles so much certain of the unicolored forms of *cinerea* as to be with difficulty distinguished except by the generic characters.

CANTHARIS, Linn.

C. (*Lytta*) **mutilata,** n. sp.—Body black, head and thorax red. Head with very few punctures, epistoma and parts of mouth black. Thorax subpentagonal very little wider than the head, a very fine median line, surface very sparsely punctured. Elytra black, rather finely scabro-punctate, smoother near the base. Body beneath black, moderately shining, sparsely punctate. Legs black more densely punctate. Length .86 inch; 22 mm.

Male.—Antennæ with fifth joint deformed, excavate anteriorly and with the anterior angle slightly prolonged, sixth joint slightly flattened, 7—10 oval, 11 slightly longer and pointed. Anterior tibiæ with two spurs, hind tibiæ with inner spur slender acute, outer longer, cylindrical and obliquely truncate at tip. Last dorsal segment oval at tip, fifth ventral truncate, sixth very feebly emarginate. Hind trochanters simple.

Female.—Unknown.

This species should be placed next to *eucera* in my revision of the species of this genus.

For the privilege of studying a perfect male, I am indebted to Mr. Otto Lugger of St. Louis.

Occurs in Arizona.

ZONITIS, Fabr.

Our species are distinguished as follows:

Eyes lateral, not extending beneath the head; antennæ at most half the length of the body.
- Legs bicolored.
  - Elytra black, head and thorax yellow........................**atripennis** Say.
  - Body above pale yellow, elytra tipped with black..............**flavida** Lec.
  - Body above pale yellow, elytra with piceous vitta.........**bilineata** Say.
- Legs piceous.
  - Body above and beneath pale sanguineous..........................**rufa** Lec.

Eyes large, extending beneath the head, and comparatively approximated; antennæ setaceous, nearly as long as the entire body.
- Thorax and elytra very densely punctured................**longicornis** Horn.
- Thorax and elytra very sparsely punctured................**vittipennis** n. sp.

Z. bilineata may become unicolored, pale yellow, but the elytra are always coarsely punctured.

Z. vittipennis, n. sp.—Form elongate, pale yellowish testaceous, moderately shining. Antennæ nearly as long as the entire body, setaceous, piceous. Head oval deeply but sparsely punctured. Eyes large, coarsely granulated, extending beneath the head. Thorax subcampanulate, not wider than long, disc shining, sparsely and irregularly punctured. Elytra pale yellow, with two piceous vittæ on each, one near the suture, the other broader near the side margin, neither attaining the tip or base, surface with coarse shallow punctures becoming more indistinct at base. Body beneath colored as above, shining, sparsely punctured; abdomen densely punctured. Femora yellow tipped with piceous, tibiæ piceous yellow at base, tarsi piceous. Length .40 inch; 10 mm.

The body above is sparsely clothed with short, yellowish inconspicuous hairs, those of the under surface are somewhat longer and denser.

One male, Arizona.

This species and *longicornis* may vary in the extent of the piceous elytral vittæ. The type of the latter was described as having brownish-testaceous elytra, with suture, margin and narrow median stripe paler, but specimens have occurred marked similarly to *vittipennis*, that is, with the paler color predominating.

CISTELIDÆ.

CISTELA, Fab.

C. Thevenetii, n. sp.—Piceous, subopaque, form elongate. Head piceous, rufous in front, minutely and densely punctulate. Antennæ subserrate, nearly as long as the entire body, piceous, three basal joints rufous, joints two and three short, together but little longer than half the fourth. Thorax piceous, minutely and densely punctulate, broader than long, sides regularly arcuate and gradually narrowing to apex. Elytra not wider than the thorax and nearly four times as long, black, striate striæ finely punctured, intervals slightly convex, sparsely and very minutely pubescent. Body beneath piceous, more shining than above, sparsely punctulate. Legs pale rufous, tibiæ and tarsi somewhat darker. Length .30 inch; 7.5 mm.

This species belongs to the same group of the genus with *opaca* and is easily known by its slender form and red legs.

One specimen Mariposa, Cal., from M. Jules Thevenet.

C. variabilis, n. sp.—Form oval, color variable. Head densely punctured. Antennæ half the length of body, slender, second joint half as long as third, the latter as long as the fourth. Thorax broader than long, gradually narrowing to apex, surface more densely punctulate than the head, very sparsely pubescent. Elytra oblong oval, minutely punctulate, more shining than the thorax, and with feeble traces of the two inner striæ only, surface sparsely cinereo-pubescent. Prosternum beneath rugulose, metasternum smooth at middle, sides sparsely punctured, abdomen shining, sparsely punctulate. Length .20 inch; 5 mm.

Somewhat broader than *sericea* which it otherwise resembles. Varieties in color occur as follows:

a.—typical, black, thorax red, beneath and legs piceous, the latter sometimes red.

b.—entirely piceous, varying with paler legs and elytra.

c.—entirely testaceous, as in *sericea.*

Occurs rather abundantly all over California.

Notes on CICINDELIDÆ of the United States.

BY JOHN L. LECONTE, M. D.

OMUS Esch.

O. Hornii.—Robust, dull black, with a slight silky lustre, head with a few indistinct rugæ between the eyes. Prothorax little wider than long, subquadrate, less narrowed behind than in any other species, and less convex; hind angles rounded, disc slightly rugose at base and tip, transverse impressions distinct but not deep, dorsal line fine. Elytra rather broadly ovate, wider than the prothorax, much rounded on the sides, deeply punctured, with a few larger but not conspicuous punctures intermixed. Legs rather slender, about as in *O. Audouini.* Length 16.5 mm.; .65 inch.

One female collected by Mr. Joseph Willcox at Yosemite in California. A remarkable species, eminently distinct by its broader form, more quadrate prothorax and different sculpture.

CICINDELA Linn.

C. longilabris *Say.*

I have mentioned in another place a beautiful green specimen from Newfoundland, given me by Mr. Chevrolat; I wish now to call attention to a variety found in Oregon and Utah, which is either bluish green, bronze, or black, but differs from the ordinary Canadian race of this species by less opaque surface, and more deeply punctured elytra.

Dr. S. Lewis has given me a specimen from the mountains near Denver, Colorado, of a fine bronze color, but more elongate and more convex in form, in which the white markings are broader and more conspicuous; the humeral and apical lunules are entire, and the medial band is connected along the margin with the humeral lunule.

C. montana Lec., Proc. Acad. 1861, 338, is to be suppressed as a species, and must be considered as a race allied to the one above mentioned, with the elytra less elongate and more convex than usual. The labrum of the ♀ is dark, but I have observed a tendency to the same peculiarity in other instances, and am not disposed to regard it of specific value.

C. scutellaris *Say.*

Specimens occur in Texas of a blue-green color, resembling closely in appearance the race *unicolor* which occurs in Georgia and Florida, but having the prothorax finely rugose, as in the typical *scutellaris* with copper colored elytra. Baron Chaudoir is quite correct in considering *rugifrons*, *Lecontei*, *unicolor* and *scutellaris*, as races of one species, differing greatly in color, and to a less extent in form and sculpture, but both he and Crotch, who has followed him in the "Check List," have omitted to observe that in this consolidation of names, *scutellaris* (1823), must take precedence over *rugifrons* (1825).

C. 10-notata *Say*.

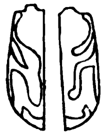
One ♂ differs from the others in my collection by having the labial palpi pale, with the last joint metallic. This species is very closely allied to some of the races of *C. splendida*, but the prothorax is smaller and more convex, and the medial band of the elytra runs much farther backward. The form next mentioned is however nearly intermediate in the latter respect.

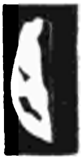
a.—Two specimens from California, of a bright green color, marked nearly as in 10-*notata*, but the humeral and post-humeral spots are absent, and the medial band is a little shorter.

β.—A male specimen from Nebraska, of a bright green color, the spots much reduced in size, and the medial band represented only by its outer part, which is perpendicular to the side margin of the elytra. The labial palpi are pale, with the last joint dark.

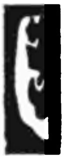
C. hyperborea *Lec.*, New Species, Smiths. Misc. Coll. 1.; var. *C. limbata* || *Say*, Journ. Acad. III., 139.

This long lost insect has been recently found by Mr. E. P. Austin of the U. S. Coast Survey, on hills of white sand in Northern Nebraska, and proves to be a form of the species, which in its normal marking was described by me as *C. hyperborea;* I repeat here the two wood cuts given by Dr. Horn (Proc. Ac. 1866, 397), and add one of this extreme variety to show how easily by a slight variation in breadth of markings a quite different appearance will result. The description of Say relates solely to color, and therefore the identity of his species with *hyperborea* could never have been suspected. In consequence of this determination the name *limbigera* proposed by Gemminger and Harold, Cat. Col. 20, to replace the preoccupied name used by Say, becomes unnecessary.





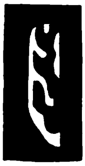
C. Wapleri.—Elongate, slender, allied to *C. cuprascens*, with the elytra equally coppery and deeply punctured; side margin broadly white; basal spot small, humeral lunule curved, not hooked behind; medial band suddenly refracted, and hooked, not extending far backwards, and not curved in a sigmoid manner as in *C. cuprascens;* white lobe representing apical lunule very broad, obtuse. Other characters as in *C. cuprascens*. Length 10 mm.; .40 inch.



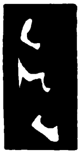
♂.—Prothorax cylindrical rather less rounded on the sides than in *C. cuprascens;* elytra obliquely broadly subsinuate near the tip. ♀, not seen.

One specimen from Mississippi, kindly sent me by Mr. A. Sallé, under the MS. name given by Baron Chaudoir. It is a smaller and more graceful species than the one with which I have compared it, and easily recognized by the elytral markings. The tooth of the labrum is hardly apparent.

C. Magdalenæ Lec., Proc. Ac. Nat. Sc., Phila., 1873, 321.



Dr. Horn has kindly prepared a wood cut from the drawing which he made from the specimen of this species in the Oxford Museum. It was found with other North American species in barrels of turpentine, supposed to be from North Carolina. The markings as will be seen resemble those of *cinctipennis*, with the addition of a basal spot and an elongate spot on the suture, extending nearly to the middle. The prothorax is finely rugose; the dark parts of the elytra are distinctly punctured, and the tips are finely serrate. These characters indicate that it belongs in the group with *blanda*, *macra*, *cuprascens*, etc.



C. nevadica.—Coppery bronze, head moderately large, eyes less prominent than in *C. sperata*, front sparsely hairy, finely striate near the eyes. Prothorax nearly cylindrical, finely rugose, transverse impressions deep, sides hairy. Elytra deeply but not coarsely punctured, marked as in the adjoining figure, proportioned as in *C. sperata*, sutural spine distinct. Legs long and slender, claws large, hind trochanters red. Labrum transverse, nearly straight in front, not distinctly toothed at the middle; palpi pale, last joint only dark. Length 11 mm.; .43 inch.

♂.—Prothorax with the sides slightly rounded; elytra obliquely and broadly subsinuate near the tip.

♀.—Prothorax with the sides straight, and the base somewhat flattened; elytra obliquely and strongly sinuate near the tip; anterior angle of the sinuation obtuse and rounded.

Nevada, Mr. E. P. Austin. This species is allied to *C. sperata*, but differs by the tooth of the labrum being obsolete; by the markings of the elytra not connected at the side margin, and by the posterior part of the humeral lunule less oblique, not hooked, and by the medial band less prolonged behind. Finally the prothorax of the ♀ is less distinctly flattened near the base.

C. politula.—Above black, somewhat shining, slightly tinged with blue and bronze on the head and prothorax; beneath and legs blue, abdomen ferruginous. Head striate near the eyes, front convex very finely striate. Prothorax finely rugose, not longer than wide, transverse impressions deep, sides broadly rounded. Elytra convex, oblong, finely and densely punctulate, tips rounded, obsoletely serrate, sutural spine very small, terminal lunule represented by a narrow short white line, which is sometimes obsolete. Labrum white irregularly rounded in front, tooth obsolete; labial palpi pale, with the last joint dark. Length 12 mm.; .475 inch.

Texas. This species has been long known under the name here adopted, but I cannot find that it has been published. It is of the size and general form of *C. punctulata*, but quite different in its characters, which ally it to *C. abdominalis*. The white hairs are sparse, and visible only on the under surface; the series of large punctures usually seen on the elytra near the suture are not distinct, or barely perceptible.

C. abdominalis.

A singular race of this species was found by Messrs. Hubbard and Schwartz, at Cedar Keys, Florida. The specimens differ from those found in Georgia and New Jersey, as well as from others collected in Florida, by the elytra being quite strongly and deeply punctured; the large punctures or foveæ near the suture are also deeper. Otherwise I can discover no difference, and am therefore unwilling to characterize this peculiar form as a distinct species.

C. marginipennis *Dej.*

Mr. F. G. Schaupp has informed me that during the past summer he collected this species at Calicoon, Sullivan Co., New York. The only locality previously known is at Harrisburg, Penna. It will probably be found at various points in the upper valleys of the Susquehanna and Delaware rivers.

C. striga.—Dark bronze, with a slight olivaceous tinge, shining. Head large, scarcely concave between the eyes, which are large and prominent; a few short lines are visible each side between the eyes. Prothorax not longer than wide, convex, with a few distinct rugæ, especially near the tip and base, front transverse impression deep, hinder one indistinct, dorsal line faint, sides moderately rounded. Elytra elongate oval, humeri distinct, surface sparsely but strongly punctured, subsutural foveæ large and deep, tips rounded, not serrate; apical lunule narrow, bent obliquely inwards and forwards at the anterior extremity; medial band represented by a submarginal whitish spot. Body beneath thinly clothed with white hairs. Labrum transverse, truncate in front, and subsinuate each side; maxillary and labial palpi pale, with the last joint dark. Length 13.5—16.5 mm.; .53—.65 inch.

♂.—Labrum white, nearly rectilinearly truncate in front, medial tooth obsolete.

♀.—Labrum brown, truncate and subsinuate in front, medial tooth large and acute.

Lake Harvey, Florida, May 4th, Messrs. Hubbard and Schwartz. This species is allied to *C. severa*, but is quite different by the polished surface, the deeper punctures of the elytra; the form of the labrum, which is without a tooth in ♂, and only unidentate in ♀; by the maxillary palpi being also pale, with only the last joint dark; by the head not concave between the eyes, and with fewer rugæ near the eyes, and by the posterior transverse impression of the prothorax almost obliterated.

The habits of this insect are peculiar; it was found only in the twilight, or night, near the camp fires. The third joint of the maxillary palpi is scarcely shorter than the fourth joint, agreeing in this respect with *C. severa.*

C. maga.—Sooty black, tinged with greenish, without lustre. Head without striæ, not concave between the eyes which are large and prominent. Prothorax not longer than wide, moderately narrowed behind, sides rounded and sinuate, transverse impressions well defined, dorsal line very fine, disc convex, sparsely pubescent, not rugose. Elytra elongate oval, humeri not prominent, tips not serrate, broadly and separately rounded, suture a little retracted in ♀, but the spine is wanting in both sexes; sparsely and finely punctured, foveæ of subsutural row well marked. Beneath opaque black, slightly pubescent, tibiæ and tarsi brownish. Labrum with three distinct teeth. and strongly sinuate each side. Palpi pale with the last joint dark. Length 12 mm.; .5 inch.

Three specimens from Lake Ponchartrain have been kindly communicated by Mr. F. G. Schaupp.

This species is closely related to *C. Pilatei* but differs by much narrower form, different color, stronger punctuation, and different apex of the elytra, and by the prothorax being more narrowed behind, and by the eyes being larger and prominent.

The labrum, as in *C. Pilatei* is black in the ♀, and black with a large white spot in the ♂.

Found in woods, near Lake Ponchartrain, Louisiana.

C. hirtilabris.—Slender, bronzed brown, body beneath, prothorax and head clothed with fine prostrate white hair, labrum white clothed with similar hair, with a small indistinct tooth at the middle. Elytra with a broad white border, feebly dilated in the region of the humeral lunule, middle band broad, marked with numerous dark points and lines, producing a ramose appearance, immediately behind which is a dilatation representing the apical lunule, there is also a small basal spot; the dark spaces are strongly punctured and the sutural spine is obsolete. Palpi pale, with the last joint dark. Legs very long and slender, hind trochanters dark red, claws large. Length 9.3 mm.; .62 inch.

♂.—Elytra obliquely narrowed near the tip, then suddenly rounded and subtruncate, suture not retracted; ventral segments uniformly pubescent.

♀.—Elytra obliquely sinuate near the tip, then suddenly rounded; suture slightly retracted; anterior angle of the sinuosity obtuse not prominent; last ventral segment glabrous.

Florida, Mr. F. G. Schaupp. Of the same form as *C. gratiosa*, but with finer pubescence and less dilated white markings, though the basal spot is frequently connected with the margin. It is remarkably distinct from all the other species known to me by the labrum being clothed with fine prostrate white hair, like the head and prothorax.

In one specimen the posterior angle of the white dilatation representing the apical lunule is prolonged inwards, and slightly hooked.

It is found promiscuously with *C. tortuosa*, *punctulata*, and both varieties of *abdominalis*, on small sandy paths through meadows, near Hogarth's landing, and near Spring Cove. They were seen in July, August and September; in July *abdominalis* was abundant, and *hirtilabris* scarce; but later, these proportions were reversed.

The position of this species is in the group with *blanda*, *cuprascens*, etc., next to *gratiosa*.

Notes on the RHYSODIDÆ of the United States.

BY JOHN L. LECONTE, M. D.

On comparing specimens of *Rhysodes* and *Clinidium* from the Pacific States with those from the Atlantic district, I have recently observed some characters which induce me to regard them as specifically different. In pursuing my investigation, I have found certain sexual peculiarities which seem to have been overlooked, and which will probably render necessary a new study of the species heretofore described, and a more accurate definition of their characters.

These sexual differences are to be perceived in the anterior femora, and in the hind tibiæ; sometimes also in the middle tibiæ. I have endeavored to indicate the differences in the tibiæ in the adjoined wood cuts.

RHYSODES Dalman.

§.—Prothorax with three entire deep grooves; elytra striate, not costate; middle and hind tibiæ with one terminal spur.

1. R. exaratus *Serv.*, Enc. Méth. X., 308, 1825; (nec Dalman). Westwood, Zool. Journ. V., tab. 46, p. 1.

R. americanus Lap., Silbermann's Rev. Ent. IV., 58, 1836.

R. aratus Newm., Mag. Nat. Hist., 1838, II., 663; Germar. Zeitschr. II., 344.

Atlantic States, New York to Georgia and westward to Missouri. The prothorax is about one-half longer than wide, broadly rounded on the sides, more rounded near the tip; the furrows are very deep, and the two outer ones are dilated behind; the disc is convex on the sides, and the side margin is not visible from above. The elytral striæ are composed of approximate punctures, and the inner striæ are somewhat impressed.

♂.—The front thighs are armed with a very distinct tooth; the middle tibiæ are produced inwards at tip into a small cusp, and the terminal spur is slightly curved; the hind tibiæ are obliquely impressed on the inner face, and slightly dilated at tip, terminal spur small, straight.

♀.—Front thighs not toothed; middle and hind tibiæ not dilated at tip.

I have excluded from the synonymy reference to the descriptions of European specimens which have been considered identical by Erichson, Chevrolat and other authorities, because the hind tibiæ are described by Erichson as being dilated in an almost hook-like form, which would indicate a greater resemblance to the next species.

Should they prove on comparison to be different, then it will be necessary for the European species to receive another name.

In case the name *exaratus* is considered as involved in too great confusion, in consequence of its use first by Dalman, and second by Serville for two different species, the name *americanus* will have priority over *aratus* which has been adopted by Gemminger and Chevrolat. I have preferred to retain *exaratus*, for although it was first applied by Dalman to another species, it appears that Fabricius had previously described the latter as *Cucujus sulcatus*.

2. R. hamatus.—Brown-black, shining, head rather obliquely narrowed behind the eyes, which are subtruncate behind, and lateral. Prothorax more than one-half longer than wide, with three very deep entire grooves; elevated spaces sparsely but distinctly punctured. Elytral striæ deeper than in the preceding, and more coarsely punctured. Length 5.5—7.5 mm.; .21—.30 inch.

♂.—Front thighs armed with a distinct tooth; apical cusp of middle tibiæ longer, acute; hind tibiæ broadly dilated, more deeply grooved on the inner side, with the terminal dilatation transverse, acute at the inner end; apical spur small.

♀.—Front thighs not toothed, middle and hind tibiæ simple.

California, Mr. Behrens and Dr. Horn. Narrower than the preceding, with the prothorax longer, less suddenly rounded in front, and somewhat less convex. The elevated spaces of the head and prothorax are sparsely punctured, and the elytral striæ are much deeper.

CLINIDIUM Kirby.

§.—Prothorax with entire dorsal line, two short deep basal impressions and double lateral line, elytra costate; middle and hind tibiæ with two terminal spurs.

1. C. sculptile Chevr., Am. Ent. Fr., 1873, 213.
Rhysodes sculptilis Newm., Mag. Nat. Hist., 1838, 665; Germ. Zeitschr. II., 348.
Rhysodes conjungens Germ. Zeitschr. II., 351.

Atlantic States, not rare. I have no hesitation in placing these two names as synonyms. The form of the prothorax is quite characteristic, oblong and not oval. The differences in the descriptions are easily accounted for by the fact that Newman described the elytra as having six grooves, but did not observe that the interval between the two outer ones was abbreviated in front, about one-fourth from the base. Germar on the contrary, regarding the costæ as more conspicuous than the intervening grooves, and omitting the sutural one, described the elytra as four-costate, with the outer costa, (corresponding with the region from the fourth to the sixth grooves of Newman), as double for a part of its course. For the purpose therefore of distinguishing more easily the present one from allied species I would offer the following diagnosis.

C. sculptile.—Head obliquely narrowed behind the eyes, base nearly truncate; eyes narrow, confined to the upper surface of the head. Prothorax nearly twice as long as wide, oblong, sides broadly rounded, base and apex also broadly rounded. Elytra with the costæ narrower than the deep intervening grooves, submarginal costa abbreviated in front at the anterior fourth or rarely the fifth, and usually confluent with the next one at the posterior fourth. Length 5.5—7.5 mm.; .21—.30 inch.

♂.—Front thighs distinctly toothed; front tibiæ rather suddenly dilated on the inner side, above the oblique groove; then sinuate; middle and hind tibiæ subsinuate on the inner side, produced inwards at tip into a sharp process. Prosternum with a broad stripe of velvety surface; ventral segments with spots of similar velvety lustre.

♀.—Front thighs not toothed; front tibiæ with only the usual arrangement of hooks and teeth; middle and hind tibiæ simple, with two small apical spurs.

Slight variations occur in the arrangement of the outer costæ of the elytra, which I have indicated in the diagnosis.

C. calcaratum.—Piceous, shining, elongate. Head obliquely narrowed behind the eyes, base subtruncate; eyes narrow, rather prominent, confined to the upper surface of the head. Prothorax nearly twice as long as wide, regularly elongate-oval, (not oblong); angles not apparent. Elytra with the costæ towards the base wider than the intervening furrows, submarginal costa and the next entirely confluent, with only a line of punctures indicating the separation. Length 7.5 mm.; .30 inch.

♂.—Front thighs not toothed; front tibiæ very feebly dilated on the inner side; middle and hind tibiæ with a large pointed apical process on the inner side, one-half the length of the tibiæ, apical spurs two, small straight; under surface without velvety spots.

♀.—Middle and hind tibiæ simple.

Two specimens from Vancouver Island, kindly given me by the Rev. A. Matthews, and one from Oregon by Mr. Ulke. The line of punctures on the outer costa of the elytra is deeper in one than in the other specimens, and indicates probably a variation in sculpture similar to that observed in *C. sculptile*.

In regard to the affinities of this family, that they are very complex has been recognized by all observers, but they have in the main agreed that the nearest relationship is with the Cucujidæ. The resemblance in several important structural details with the Carabidæ has been well pointed out, especially by Erichson, Ins. Deutschl., III, 298, and has been exaggerated by Crotch to such an extent, that he has placed Rhysodidæ as a family of the series ADEPHAGA.

There are, however, two lines of resemblance which I have failed to appreciate, though they have been indicated by excellent authority; these are with the Longicorn series in *Spondylis*, *Parandra*, etc.; and with Rhynchophora in certain Brenthidæ; it is true that the moniliform antennæ give a somewhat similar effect upon a first view, but there is so little similarity in the structure of the antennal surface, when minutely examined, that I can attach no importance to these supposed relationships.

The great master in classification, Latreille, who first proposed the genus *Rhysodes*, though he did not describe it, had a clearer recognition of the true affinities, when he associated it with *Cupes*. This approximation has not received the approval of other investigators, though I hope to demonstrate its correctness. The error which has heretofore obscured the perception of this affinity has been the incorrect placing of *Cupes* in the Serricorn series near Ptinidæ, with which it has only the remote relationship which I will point out below.

The extraordinary Australian genus *Omma* Newman, which the describer could not refer to any family at that time established, was recognized by him to have affinities with *Rhysodes* and *Cupes*; Erichson, followed by Lacordaire, referred it doubtfully to the Cucujidæ, but without having had the opportunity of examining it.

By the kindness of Mr. C. O. Waterhouse of the British Museum, I made a careful study of the type of *O. Stanleyi* preserved in that institution, and perceived very soon that it was closely allied to the *Cupes serrata* which I had described from Oregon; this observation is published in the Proc. Acad. Nat. Sc. Phila., 1873, p. 334, No. 195.

On a closer study of the four species of Cupesidæ found in the United States, I was obliged to separate *C. serrata* as a distinct genus *Priacma*, (Trans. Am. Ent. Soc., 1874, p. 87). This insect from its larger size and stouter form enables the important characters of the under surface to be studied with more ease than the other species.

Commencing then with the head, we find the following resemblances between the Cupesidæ and the Rhysodidæ:

1. In *Cupes* the eyes are almost smooth as in *Rhysodes*, though the very small lenses may be perceived under the epidermis; in *Priacma* the eyes are very finely granulate, but not smooth.

2. The lobed head of *Cupes* and the form especially of the hind part, and its junction with the prothorax are all suggestive of *Rhysodes*.

3. The prothoracic episterna are separate in *Cupes* and *Priacma*, though wider and more distinct in the latter.

4. The front coxæ are peculiarly small in both families.

It is also to be considered that in other characters these two families in question differ very greatly. The front coxal cavities are entirely enclosed in Rhysodidæ, while they are open behind and partially formed by the mesosternum in Cupesidæ. The middle coxæ are widely separated in the former, quadrate and contiguous in the latter. The hind coxæ are widely distant in Rhysodidæ; transverse, meeting on the median line, and extending to the side of the body in Cupesidæ. The basal ventral segment of the abdomen is visible at the sides and at the middle in Rhysodidæ, while it is entire and uninterrupted in Cupesidæ.

We thus see that the two families differ from all other Coleoptera in the characters which they possess in common; while in those by which they differ from each other, (many of which I have not mentioned), they agree with some other families or genera.

I think therefore that we are justified in regarding them as fragments, widely separated it is true, of a series of Coleoptera existing in former times, which was of an undifferentiated nature. This series was the original stem, or contained the ancestry, if I may use the realistic expressions of a modern school, of the several series which are comprised in the now existing great complex of normal Coleoptera, with the penultimate joint of the tarsi not anchylosed to the last joint. This complex consists of the series Adephaga, Clavicornia, Lamellicornia and Serricornia.

To attempt to intercalate such anomalous families as Rhysodidæ and Cupesidæ among the families which properly constitute the four series above mentioned, would be like finding a place for *Archæopteryx* in our classification of existing birds; *Ceratodus*, *Lepidosteus* and *Lepidosiren* among normal fishes, or Prof. Marsh's *Dinocerata* among recent mammals.

Looking at the two families from this point of view we see in Rhysodidæ a prothoracic structure, with feet that are suggestive of Carabidæ (*Clivina*, etc.); mouth rather peculiar, somewhat resembling *Catagenus*, but more related to *Omma* and *Priacma;* coxal arrangements similar to Cucujidæ; ventral segments combining Adephagous and Clavicornious characters.

In *Clinidium* moreover a form of eye confined to the upper surface of the head, which reminds us of Pseudomorphidæ.

In Cupesidæ we observe varied forms of antennæ; somewhat perfoliate, (*Omma*, *Priacma*); nearly filiform (*Cupes* sp.), or feebly serrate (*Cupes* sp.); gular sutures, (which are constant in great series of other Coleoptera) varying almost according to species; (Tr. Am. Ent. Soc., 1874, p 88). We also observe an arrangement of coxæ, and prothoracic side pieces unknown in the Serricorn series; the former resembling nothing else, the latter feebly indicative of the higher development of the Rhysodidæ and Carabidæ.

I have already suggested (Class. Coleopt. North Am. 279), similar views concerning the relations of the Spondylidæ, as a fragmentary survival of ancient forms, with our existing Cerambycidæ and other families. After a careful study of *Trictenotoma*, I am disposed to see in it also a survival of a series which in former ages represented the objects that we now know as Tenebrionidæ, with a strong resemblance to Prionidæ and Lucanidæ, and perhaps a slight tendency towards Cucujidæ.

Without dilating upon the subject at the present time, I may here observe that the immediate relations of *Trictenotoma* is with the Heteromerous series, in which it forms a family distinguished from Tenebrionidæ by the front coxæ being transverse and the coxal cavities angulated externally and open behind. The tarsi which are nearly similar to *Epitragus*, and the antennæ which resemble in type those of many Tenebrionidæ, though differing in modification from any tribe of that family, confirm this view. The sensitive surface is confined to the last three joints, the ninth and tenth being triangular, produced inwards, with the apical surface alone sensitive and velvety; the eleventh joint is oval, somewhat acute at tip, and covered entirely with sensitive surface. These sensitive surfaces are subdivided into two by a transverse line, well marked on the ninth and tenth, but feeble on the eleventh. The other joints are entirely without sensitive pores, but the eighth is thickened and elevated at the distal end; the first joint is as long as the three following and stouter. Now this restriction of sensitive surface to the distal end of the outer joints of the antennæ so far as I know occurs only in Tenebrionidæ and Lucanidæ, and the particular modification in form seen in *Trictenotoma* does not occur in either of those families. The mouth does not resemble at all that of the Cerambycidæ; in the latter the ligula is attached at the end of the mentum, and the intervening coriaceous piece is quite apparent; in *Trictenotoma* the mentum is larger, feebly emarginate, and the ligula is inserted behind it as is the case with *Lucanus*. The insertion of the antennæ, and the form of the side of the head in front of the eyes is also similar to the Lucanidæ. I therefore regard the affinities as strong in that direction; while the relation to the Prionidæ is one mostly of external resemblance. I may also observe, that the mandibles of *Trictenotoma* are quite different from those of *Prionus*, etc., in having on the under surface a fringe of long ciliæ as in *Leptura*. If therefore it has any affinity to Cerambycidæ, it is towards the whole family, and not specially to the Prionidæ subfamily.

The original and earliest ideal forms of Coleoptera, which combined the characters of the Isomerous and Heteromerous normal Coleoptera with the Rhynchophora, are unknown, and if they ever existed, have probably become extinct in the measureless lapse of ages since they flourished upon the earth.

The only indications we have of their possible existence, are the resemblances in form of certain Anthribidæ to Lamiidæ; the Rhynchophorous modifications of the prosternum in Nematidium and other Colydiidæ, as well as in Cossyphus; and the similar form of mentum in the higher Tenebrionidæ to that observed in some Otiorhynchidæ. The affinity of *Rhinomacer* with *Rhinosimus*, etc., may also be mentioned. I do not regard any of these relations as very strong; and many wide breaks have to be filled in our series before they can admit of satisfactory demonstration.

Descriptions of New COLEOPTERA of the United States with notes on geographical distribution.

BY JOHN L. LECONTE, M. D.

Leistus piceus (*Frohlich*); *Frohlichii* Duftsch.; *analis* Dej.

A specimen of this common European insect was found at Fitchburg, Mass., and kindly given to me by Mr. H. G. Hubbard.

Dyschirius salivagans.—Elongate, pale ferruginous, shining. Clypeus truncate, with the angles slightly prominent and rounded, sides of front rounded, distinctly separated from the angles of the clypeus; frontal impressions deep, rugose, connected by a deep transverse line, vertex slightly punctulate. Prothorax longer than wide, oblong oval, scarcely narrower in front. Elytra elongate, cylindrical with well marked slightly punctured striæ, effaced towards the base, but not at the tip; dorsal punctures two, situated on the third stria; marginal stria abbreviated at the humerus. Front tibiæ scarcely denticulate, apical process longer than the terminal spur and curved. Length 4 mm.; .16 inch.

Great Salt Lake, Utah; one specimen kindly given me by Mr. Ulke. Allied to *D. pallipennis*, but larger and more slender, with the sides of the front more rounded, and the angles of the clypeus more prominent and rounded, almost as in *D. sellatus;* from which, however, it also differs by the more elongate form, and by the striæ of the elytra effaced for a greater distance near the base. The head is not rugose, and only very sparsely punctulate.

This is a very interesting addition to our fauna, carrying as it does, the distribution of the *pallipennis* group into the closed basins of the interior of the continent.

Holciophorus serripes.—Oblong, elongate, black, not very shining. Prothorax scarcely longer than wide, quadrate, slightly narrowed behind, sides subsinuate near the base; basal angles rectangular; dorsal line deep, transverse impressions indistinct; basal impressions linear, distant, the inner one about one-fourth the length of the prothorax, the outer one short, adjacent to the angle; side margin narrow, broken by a few distant crenulations, base sinuate, margined only near the angles. Elytra with dentiform humeral angles, and well reflexed margin, basal marginal line deep; striæ deep, distinctly yet finely punctured; scutellar stria short, between the first and second. Length 15.3—18 mm.; .6—.71 inch.

♂.—Last ventral segment with a broad triangular impression, and an elevated fold becoming broader towards the tip; middle and hind tibiæ serrate on the inner edge; hind tarsi rather stout.

♀.—Last ventral segment broadly impressed behind, with a short medial elevation not extending to the tip; middle and hind tibiæ not serrate; hind tarsi more slender.

One pair, collected by Mr. Jos. Willcox in Yosemite Valley, Cal. The hind tarsi are marked on the outer side of the first joint with two very fine and almost indistinct striæ. This species bears a deceptive resemblance to *Pterostichus tarsalis*, and *herculaneus*, (which is not *crenicollis* Lec., as has been stated in consequence of some confusion of specimens), but is easily recognized by the impressed last ventral segment of both sexes, and the serrate tibiæ of the ♂.

Coprophilus striatulus *Er.* Staphy. 816; *Staphylinus striat.* Fabr., etc.

A specimen of this rare European species was found by Mr. Pettit in Canada, and kindly given to me.

Zalobius serricollis.—Depressed, piceous, covered with a dirt colored crust, densely punctured. Head with an acute elevated line each side from the front to the occiput, and two short elevated lines behind; base truncate, hind angles rounded. Prothorax wider than the head, one-half wider than long, ovate, narrowed behind, sides broadly flattened, distinctly and obtusely serrate; disc with four fine elevated lines. Elytra with numerous striæ and elevated lines, of which the humeral and submarginal are most conspicuous; the former becomes indistinct behind, and the latter in front. Abdomen sparsely finely pubescent. Length 3.4 mm.; .13 inch.

Owen's Valley, California; Dr. Horn. Very different in specific characters from *Z. spinicollis*, though apparently belonging to the same genus.

Colastus agavensis and *yuccæ* Crotch, Trans. Am. Ent. Soc., both belong to *Carpophilus;* the anal segment of the ♂ is quite distinct; the first is allied to *discoideus*, the second to *melanopterus*.

Dacne picea.—Oval elongate, convex, shining piceous, glabrous; head and prothorax finely not densely punctured, sides of the latter nearly straight, except towards the tip, where they are feebly rounded. Elytra more finely punctured, punctures not arranged in rows; humeri rufo-piceous. Beneath punctulate finely pubescent, antennæ and legs ferruginous. Length .3 mm.; .12 inch.

One specimen, California. Quite distinct from our other two species by the finer punctuation, which on the elytra is not arranged in rows, by the absence of elytral spots, and by the sides of the prothorax nearly straight, converging in front. The elytra are also comparatively longer.

Mr. Crotch was quite correct in restoring the name *Dacne Latr.*, (1796), to this genus and suppressing *Engis Payk.*, (1798).

HYPODACNE, n. g.

I have established this new genus upon a small insect resembling in form, mouth, sternum, coxæ and legs *Dacne*, but differing by the tarsi not hairy beneath, with the joints one to four shorter, closely united so as to become difficult of detection; and by the ninth joint of the antennæ closely united with the tenth forming an obtuse compressed club; the eleventh is connate with the tenth, and not distinct.

H. punctata.—Piceous shining, oval convex, not densely punctured, mouth antennæ and feet paler. Prothorax twice as wide as long, gradually narrowed from the base forwards, slightly rounded on the sides, which are finely margined. Elytra more deeply punctured, punctures not arranged in rows. Tibiæ slightly dilated, as in Dacne. Length 2.4 mm.; .09 inch.

Middle, Western and Southern States. Less elongate than *Dacne*, and more nearly resembling in outline a small *Tritoma*, (*Cyrtotriplax* Crotch). The prothorax is scarcely perceptibly margined at base, which is broadly sinuate; the under surface is very sparsely punctulate. The eyes are coarsely granulated.

Triphyllus elongatus—Elongate, dark piceous, punctured and pubescent. Head with the front concave, and a small occipital impression. Prothorax wider than long, sides rounded, strongly margined, subcrenulate, disc with two vague impressions, sometimes scarcely apparent; tip truncate, front angles rounded, hind angles rectangular. Elytra about four times as long as the prothorax, more strongly punctured, pale brown, usually darker towards the sides. Beneath densely punctured, mouth, antennæ and legs piceous. Length 4 mm.; .16 inch.

Alaska to California.

Cyphon robustus.—Brown, clothed with short suberect pubescence. Prothorax twice as wide as the head, nearly three times wider than long, sides and apex rounded into a semielliptical curve, base bisinuate, sides somewhat reflexed, disc finely not densely punctulate. Elytra rather strongly punctured, with an obsolete sutural stria and three very indistinct dorsal costæ. Antennæ half as long as the body; second and third joints equal, united as long as the fourth. Length 5 mm.; .20 inch.

New York; one specimen kindly given me by Mr. Ulke. Larger and more robust than the other species in our fauna, resembling in form *Helodes* (*Microcara*) *explanata*, from which, however, it differs in other characters, both generic and specific. In view of the faintly marked elytral costæ, I do not feel justified in considering this species as *Elodes obscura* Guérin, which remains unknown to American entomologists.

Cyphon murinus Dej., which was not seen by Guérin, as far as I can judge by a MS. drawing by my father, is *Dicranopselaphus nervosus*.

Eucinetus strigosus.—Elongate oval, rather pointed before and behind, convex, shining black, very finely and scarcely perceptibly pubescent. Elytra with well marked distant transverse undulated lines; sutural stria deep, the others faint, effaced towards the base. Beneath finely and densely punctulate and pubescent, antennæ and legs brown. Length 3 mm.; .12 inch.

Pennsylvania, Bedford Co., July, on oak. Quite different from *Eu. terminalis* and *morio* by the stronger and more distant transverse lines of the elytra. The form is also less elongate and the elytra are not red at the tips.

Eucinetus punctulatus.—Elongate oval, rather more pointed behind, convex, dark brown, pubescent. Elytra very densely and finely punctured, without transverse striæ; sutural stria deep behind, obsolete near the base; other striæ wanting. Beneath finely punctulate and pubescent. Length 3 mm.; .12 inch.

One specimen, Detroit, Michigan; Messrs. Hubbard and Schwartz. Very distinct by the finely and densely punctulate elytra, without dorsal striæ.

Dictyoptera rubripennis.—Black, shining; beak as long as the head, which is finely channeled, and also transversely impressed. Prothorax as wide as long, sides and tip separately rounded, so that the front outline is sinuous each side; disc deeply channeled, uneven each side, with an elevated oblique ridge running to the side margin near the hind angles, which are acute. Elytra bright red, pubescent, rugosely punctured, with the suture, side margin and four narrow discoidal lines on each, slightly elevated. Antennæ compressed serrate, with the second joint short; third a little longer than the fourth. Length 12.5 mm.; .50 inch.

One ♀ specimen, Colorado, Mr. B. H. Smith. The tibiæ are flattened, somewhat dilated, and broadly concave. The dorsal channel of the prothorax extends to the tip, is wider at the middle, so as to be narrowly rhomboidal in form, and is again dilated at base, which is nearly straight. The antennæ are half as long as the body, not strongly serrate. The muzzle or beak is longer and narrower than in *D. perfacetus*, though less so than in *Lycus*, and the elytral sculpture is somewhat different from both.

Dictyoptera dimidiata.—Elongate black, very finely pubescent. Head feebly channeled, short, muzzle broad and rounded. Prothorax bright rufous trapezoidal, wider than long, channeled, side margins straight thickened, disc foveate near the front angles, deeply and broadly excavated each side near the base. Scutellum black. Elytra rufous for nearly half their length, then bluish-black; finely rugose, obsoletely striate. Antennæ with the second joint two-thirds as long as the third, which is shorter than the fourth. Length 7.5 mm.; .30 inch.

One ♀ specimen, Mariposa, California; Mr. Thevenet. Similar in form and sculpture to *D. perfaceta*, and differing chiefly in color.

Dictyoptera ruficollis.—Black, prothorax bright red, elytra blue-black, finely rugose, substriate. Head concave between the eyes, muzzle broad and rounded. Prothorax much wider than long, trapezoidal, channeled, margins thickened, disc deeply foveate near the front angles, very much excavated each side behind, and deeply impressed transversely behind the middle; the much thickened side margin is also foveate about the middle. Antennæ compressed, second joint one-half as long as the third, which is scarcely shorter than the fourth. Length 9.5 mm.; .38 inch.

Colorado and Oregon. Also of the same elytral sculpture and general form as *D. perfaceta*, but with much shorter and more deeply excavated prothorax.

PLEOTOMUS.—A female of this genus was found by Mr. W. H. Davis at Cumberland Gap, Kentucky. It differs from two Texas specimens by the prothorax proportionally longer, and more narrowed in front. In the absence of a male, I am unwilling to indicate it as a distinct species.

Elaphidion alienum.—Rather slender, piceous, thinly clothed with very long flying hairs. Prothorax nearly as wide as long, coarsely and deeply punctured, with three narrow smooth spaces; sides broadly rounded. Elytra deeply and sparsely punctured, punctures becoming obsolete behind the middle, where only the usual distant piligerous punctures are visible; tip rounded, sutural spine small but distinct. Antennæ nearly as long as the body, slender, joints three to six with slender spines diminishing in length, and without sensitive spaces. Length 14.5 mm.; .57 inch.

One specimen, Arizona; Mr. C. V. Riley. A singular and easily recognized species, bearing a deceptive resemblance to *Stenosphenus*, on account of the sparse punctuation and long flying hairs. The prosternum is very coarsely punctured, and the mesosternum slightly convex. The ventral segments are very sparsely finely punctured. The eyes are as coarsely granulated as in other Elaphidia. It must be placed near *E. irroratum*.

Purpuricenus magnificus.—Bright orange color, mouth, antennæ, knees, tibiæ and tarsi, black; head, prothorax and abdomen spotted with black. Elytra black, coarsely and densely punctured, with two broad orange-colored bands, connected by a narrow marginal line of the same color. Prothorax coarsely punctured, without lustre, lateral spine very strong; disc with five black tubercles, the two front ones being small. Length 38 mm.; 1.5 inch.

Arizona. I have seen but one ♀ of this beautiful addition to our fauna, which was given me by Mr. A. R. Grote. The antennæ are about three-fourths the length of the body and the outer joints are more compressed than in *P. humeralis*. The prosternum is rounded behind; the mesosternum is protuberant behind, then obliquely declivous. Besides the black spots mentioned in the above diagnosis, the trochanters and base of the thighs are also black; the black spots of the head form a transverse band behind the eyes.

The anterior orange colored band of the elytra is transverse, and extends along the suture to the orange colored scutellum, and along the side margin to the base; the posterior band is oblique forwards, commencing about one-fifth from the tip, and reaching the side margin behind the middle; the front outline is angulated near the side; the tip is obliquely and feebly subsinuate, and the sutural angle is rounded.

I was inclined to place this species in *Oxoplus*, but the mandibles are not emarginate at tip.

Leptura anthracina.—Elongate, black, finely pubescent. Prothorax a little longer than wide, gradually narrowed from the base forwards, slightly rounded on the sides, constricted near the tip; hind angles slightly laminate; disc convex, finely punctured, dorsal channel faint, posterior impression very deep, base sinuate margined. Elytra narrowed from the base, obliquely subemarginate inwards at the tip, outer angle of truncature acute, sutural angle obtuse; surface rather finely punctured, punctures not much stronger at base. Length 15—19.5 mm.; .6—.77 inch.

♂.—Fifth ventral segment flattened at tip, with the angles prolonged into obtuse processes; last dorsal rounded at tip; antennæ five-sixths as long as the body.

♀.—Fifth ventral segment slightly flattened at tip, and subtruncate; last dorsal subemarginate; antennæ two-thirds the length of the body.

One pair, Oregon. Allied to *L. plagifera* Lec., (New Spec. 224), but differs by the prothorax being narrower, less rounded on the sides, with the hind angles more produced. The terminal processes of the fifth ventral segment of the ♂ are longer. I have not mentioned the difference of color as being of specific importance because in this group of the genus it has but little value. The fourth joint of the antennæ is nearly as long as the fifth.

Spalacopsis stolata, *Newman.*

Florida and Texas. Well preserved specimens of this species, and of *suffusa* have the antennæ hispid beneath with long bristles, from the third to the seventh joint. The first joint of the antennæ in all the specimens before me is nearly as long as the head and prothorax. This species is hardly different from the Cuban *Eutheia* || *filum*, and the latter genus for which the names *Euthuorus* Duval and *Systene* Pascoe have been proposed should be suppressed.

Tanarthrus salicola.—Depressed, ferruginous, opaque, very finely and densely punctulate, finely pubescent. Head large, hind angles rounded, vertex with a narrow indistinct smooth space, occiput with a very short impressed line. Prothorax cordate, constricted near the base, dilated in front, where it is scarcely narrower than its length. Elytra wider than the prothorax, dusky at base and tip, and with a faint dusky transverse band at the middle. Antennæ with eleventh joint equal to the two preceding united, slightly constricted at the middle. Length 3 mm.; .12 inch.

Great Salt Lake, Utah. I owe two specimens to the kindness of Mr. Ulke. Similar in form to *T. salinus* but much smaller and easily recognized by the head and prothorax as densely punctured as the elytra, the more cordate prothorax, the dusky elytral bands and finally by the less elongated terminal portion of the eleventh joint of the antennæ.

Mecynotarsus candidus.—Very pale yellow, clothed with fine cinereous pubescence; disc of prothorax nearly round, not longer than wide, horn with six rounded teeth each side, and an apical one; bicarinate at the base, without a short medial carina. Length 2 mm.; .08 inch.

Columbia, S. C.; Dr. Zimmermann. Less elongate than the Californian *M. delicatulus* Horn, with the carinæ of the horn less distant, and the space between them not carinate. The elytra are uniform in color, without a central cloud.

Mecynotarsus elegans.—Brown, densely clothed with depressed silvery pubescence, horn, disc of prothorax, sutural stripe as far as the middle of the elytra, transverse band about the middle and oblique band behind the middle sericeous brown; horn with two approximate carinæ extending nearly to the tip, with three large teeth each side, and a still broader apical tooth. Length 1.7 mm.; .07 inch.

Capron, Florida; Messrs. Hubbard and Schwartz; abundant on the seashore. The disc of the prothorax, as in *M. candidus*, is nearly globose, not longer than wide; the horn is a little shorter than the disc, and the teeth are much larger and stronger than in the other two species.

Xylophilus impressus.—Brown, pubescent, head dusky. Prothorax subquadrate, broader than long, broadly rounded at the sides and tip; very finely punctulate, with a large fovea each side behind the middle. Elytra nearly one-half wider than the prothorax, elongate oval, transversely impressed near the base, finely punctured, dusky behind the middle. Antennæ with the outer joints gradually a little wider; eleventh joint ovate, pointed. Length 1.2 mm.; .05 inch.

Texas, two specimens, Belfrage. Related to *X. piceus*, but smaller, with the thorax broader, and the impressions deeper and quite separate; the elytra more oval, and the antennæ more slender, with the last three joints comparatively wider.

Xylophilus ater.—Elongate, black, nearly uniformly densely punctured, clothed with rather long cinereous pubescence. Prothorax as long as wide, sides rounded in front, tip rounded, disc moderately convex, obsoletely channeled near the base. Elytra a little wider than the prothorax, oblong elongate, parallel, rounded behind, scarcely impressed near the base. Antennæ rather stout, hairy, slightly thickened externally, last joint larger, ovate pointed. Length 2 mm.; .08 inch.

One specimen, Texas, Belfrage.

Xylophilus nebulosus.—Blackish-brown, opaque, finely pubescent. Head and prothorax very densely punctulate, the latter longer than wide, gradually slightly narrowed in front, feebly rounded on the sides. Elytra one-half wider than the prothorax, oblong elongate, sides parallel rounded behind; base reddish-brown; a narrow acutely angulated transverse band of sericeous pubescence about the middle, and a similar cloud near the tip; surface coarsely and densely punctured. Antennæ rather stout, hairy. Tarsi yellow. Length 2.5 mm.; .10 inch.

♂.—Hind thighs thickened, fringed beneath and broadly toothed; middle tibiæ bent, first joint of middle tarsi fringed; last joint of antennæ as long as the three preceding united, but not wider; eyes large, front narrow.

♀.—Legs simple; antennæ gradually but strongly thickened externally, last joint but little longer than the preceding, pointed at tip; eyes smaller, front wider.

Pennsylvania; Louisiana. Closely related to *X. basalis*, but the prothorax is of a different form; the basal redness of the elytra is ill defined, and the angulated sericeous band, of which there is no trace in *X. basalis* is quite distinct. The sexual characters are alike in the two species.

Xylophilus subfasciatus.—Pale testaceous, thinly pubescent; head and prothorax finely punctured, the former dusky. Prothorax subquadrate, broader than long, feebly channeled towards the base. Elytra one-half wider than the prothorax, oblong, less elongate, rounded behind, strongly but not coarsely punctured; they are marked with a blackish spot near the suture and another at the side margin. Antennæ stout, joints turbinate, hairy. Length 1.6 mm.; .07 inch.

♂.—Antennæ with the eleventh joint as long as the two preceding.

♀.—Antennæ with the eleventh joint broader, ovate, acuminate.

Middle, Southern and Western States. In one specimen the elytra are deeply transversely impressed at the middle. The eyes are widely separated and the front is wide in both sexes.

Xylophilus brunnipennis.—Dark-brown clothed with cinereous pubescence. Head and prothorax finely and densely punctulate, the latter wider than long, sides rounded in front, apex rounded; disc convex, with a transverse impression near the base. Elytra one-half wider than the elytra, oblong, sides parallel, rounded behind, testaceous, finely and deeply punctured, obliquely impressed near the base. Antennæ stout, scarcely thicker externally, eleventh joint ovate, acute at tip. Length 1.8 mm.; .07 inch.

S. Carolina, (Zimmermann); Illinois, (Walsh); Texas, (Belfrage). I observe no sexual differences in the three specimens I have examined.

Xylophilus ventricosus.—Smoky brown, densely punctured, varied with angulated lines and spots of pale yellow. Prothorax nearly twice as wide as long, sides straight, hind angles obliquely emarginate. Elytra twice as wide as the prothorax, ventricose. Antennæ slender, pale, outer joints a little thicker; tibiæ and tarsi pale. Length 1.8 mm.; .07 inch.

Southern States, two specimens. The pale markings of the head, prothorax and elytra are quite complex, and difficult to describe, but the peculiarly large and inflated elytra will enable the species to be easily recognized. The eyes are smaller, and the front wider than usual.

Revision of the United States species of OCHODÆUS and other Genera of Scarabæidæ.

BY GEORGE H. HORN, M. D.

OCHODÆUS, Lep.

Having had occasion of late to examine the *Ochodæus* of our fauna, I noticed certain characters of very great importance which appear to have entirely escaped observation. These have afforded me the means of presenting an entirely new synoptic table which will render the recognition of our species much more easy and certain without regard to sex.

The mentum is described by various authors in a similar manner, Lacordaire writes: *Mentum subtransverse, a little narrower anteriorly, notched in front, ligula moderately prominent and entire.* I have examined all our species and one (*ferrugineus*) foreign, with the following result.

O. pectoralis, Lec.—Mentum in the form of a broad wedge with the base in front, which is concave longitudinally, the tip being emarginate and the sides of the base fimbriate with long hairs.

O. ferrugineus, Esch. (Siberia), has a similar mentum, but the base of the wedge is concave in every direction, while the free lower edge is more elevated and more arcuate; it is also emarginate in front and fimbriate.

O. musculus, Say.—Mentum as long as wide, narrower in front, tip broadly emarginate, and with a deep longitudinal impression extending from base to apex, deeper in front, fimbriate along the sides. A similar form occurs in *simplex* and *biarmatus*.

O. Ulkei, n. sp.—The form here is an exaggeration of the preceding. The longitudinal impression is very deep, the angles of mentum elevated (when viewed from beneath) and the tip not perceptibly emarginate. The impression is here so deep that the mentum appears very deeply bilobed. The edges are fimbriate.

O. frontalis, Lec., has a mentum as long as wide, feebly emarginate in front and a feeble longitudinal impression near the front only.

O. sparsus, Lec.—Mentum broader than long, not narrowed in front, anterior angles rounded, surface plane, not impressed, apex arcuate.

O. striatus, Lec.—Mentum broader than long, feebly narrowed in front, tip not emarginate, a transverse arcuate line of rather long bristly hairs, causing the mentum at first sight to appear very short, broadly emarginate and serrulate in front.

These variations of the form of the mentum have given me the basis of the synoptic table. Other characters however require special mention.

In all the species with one exception the prosternum is very short and truncate or broadly rounded, while in *pectoralis* the prosternum is produced into a lobe imitating in a diminished form that of *Hololepta*.

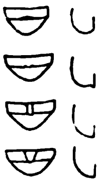
When the head is thoroughly deflexed, the globular eyes are received in fossæ at the angles of the thorax beneath. The antennæ in repose pass beneath the eyes, the clubs become approximated and are received into fossæ situated immediately in front of the anterior coxæ on each side of the short prosternum. These fossæ are more or less approximated, in *pectoralis* separated by a narrow carina, which in the other species becomes gradually broader as they stand in the table, (*biarmatus* should however be next to *pectoralis* in this respect), until in *sparsus* the carina is broad and flat.

The spur of the anterior tibia is moderately long and stout and in well preserved specimens bears on each side a row of moderately long bristles. The spurs of the middle tibiæ are dissimilar, the outer is slender, the inner broader, slightly curved and pectinate along its inner margin. This character, of extremely rare occurrence in Coleoptera, appears to have been entirely overlooked by those who have described *Ochodæus;* it is very distinctly marked in the Siberian *ferrugineus*. The posterior spurs present nothing peculiar, they are slender and long.

The first hind tarsal joint is always long but in *pectoralis* it is very long and stout, arcuate, longer than all the other joints together and longer than either spur. This species has the hind tibiæ more slender and longer than usual.

The sutural angle of the elytra is obtuse or rounded, excepting in *pectoralis* and *biarmatus*. In these the tip is sinuate before the suture, and the angle very distinctly (*pectoralis*) or obtusely (*biarmatus*) dentiform.

Certain modifications of the propygidium are worthy of notice. The posterior margin is always very slightly reflexed especially at its



middle. In this condition it remains in *sparsus*. The tips of the elytra pass under this reflexed edge in repose and are thus locked. In *biarmatus* and *pectoralis* the reflexed edge is simply notched at middle and a small acute tubercle on each side appears. Through the notch thus formed the sutural dentiform process passes and the elytra are in this manner firmly secured in repose. The next modification results in a groove running the length of the propygidium, limited on each side by a finely elevated line terminating posteriorly by joining the reflexed edge which is emarginate between them. These lines are exactly parallel in *simplex*, *musculus* and *Ulkei*, divergent in front in *frontalis* and *striatus*.

The pygidium is always short and uncovered in both sexes.

The labrum is very distinctly visible, the anterior angles broadly rounded and tip emarginate. In *sparsus*, however, the labrum is shorter, much broader, the anterior angles prominent outwardly but obtuse, the tip is more deeply emarginate.

Secondarily in importance in the accompanying table come the sexual characters of the male, and from the tendency of the sexes to approximate in the form of their hind tibiæ, a character is required which will enable the male to be known even with simple tibiæ. The club of the male antennæ is always larger, more convex, and the first joint more convex on the proximal side, and more decidedly concave on the distal. The club of the female is of a more decided lamellate type, narrower and with the joints less enclosing, the first especially being scarcely at all cupped.

At the apical end of the posterior femora, on the lower face is a lamella which forms the side of the tibio-femoral articulation. In many of the species in the male this plate is developed into an unciform process, acute at tip. This is entirely wanting in the males (as I consider them), of *pectoralis*, *simplex*, *Ulkei*, *sparsus* and *striatus*, and exists in the others, and in very well developed males of *frontalis*, a small spiniform tooth occurs near the middle of both the anterior and posterior femora.

The posterior tibiæ ♂ show four types.

First.—Tibiæ precisely identical (?) in the sexes. I have seen males only.

Second.—Tibiæ broader and more fimbriate ♂.

Third.—Tibiæ obtusely dilated at middle ♂.

Fourth.—Tibiæ toothed at middle ♂.

The characters of least importance in grouping the species are found in the form of the clypeus and the armature of the head. With one exception (*biarmatus*) the upper surface of the head is similar in the sexes.

The species may possess stridulating power, the surface of the propygidium is finely alutaceous and with a pearly lustre, and this is probably the organ for the above purpose in conjunction with the edge of the apical elytral margin.

The elytral stria present a peculiarity worthy of notice. In all the neighboring genera in our fauna the sutural stria is parallel with the margin, while the other striæ are slightly oblique; in *Ochodæus*, however, the sutural stria is also oblique and becomes very closely approximated to the sutural margin at its apical third.

The following table is presented as the result of the grouping of the characters above-mentioned.

- Prosternum lobed in front.
  - Mentum in the form of a wedge, elevated in front with the basal face longitudinally concave. First joint of hind tarsus long, stout and arcuate. Clypeus hemihexagonal, anterior edge double, front without elevations.. **pectoralis.**
- Prosternum not lobed in front, first joint of hind tarsus long but slender.
  - Mentum as long or longer than wide, more or less impressed longitudinally.
    - Mentum longitudinally impressed in its entire length; head with or without ridges, but never with an acute median tubercle.
      - Posterior tibiæ of male with an acute tooth at middle.
        - Posterior femora of male with an unciform dilatation of the articular plate.
          - Clypeus broadly hemihexagonal, with a crescentic ridge near the apical margin, front with short transverse carina.. **musculus.**
        - Posterior femora of male without tooth at the tip. Clypeus broadly hemihexagonal, anterior margin double; head without tubercles or ridges.. **simplex.**
      - Posterior tibiæ of male slightly dilated at middle.
        - Posterior femora of male without apical tooth.
          - Clypeus broadly rounded, anterior margin double; head without ridges.. **Ulkei.**
      - Posterior tibiæ of male not differing from that of female except being broader and more fimbriate.
        - Articular plate of hind femora prolonged nearly one-third the length of the femur, terminating abruptly with an acute angle, similar in the two sexes.
          - Clypeus broadly rounded, lateral angles elevated into an acute tubercle ♂, or plane ♀.. **biarmatus.**

Mentum very feebly impressed and in front only.
  Posterior tibiæ as in *biarmatus*.
    Posterior femora male with tooth at tip, and a smaller acute tooth near the apical third which may disappear; anterior femora usually with an acute tooth at middle.
      Clypeus hemihexagonal, anterior margin not double, a small acute tubercle near the suture; vertex with feeble transverse ridge..**frontalis.**

Mentum short, broader than long, not impressed.
  Mentum broader than long, not emarginate in front, with a transverse arcuate row of bristly hairs, causing the mentum to appear very short, deeply emarginate and serrulate in front.
    Posterior tibiæ as in *biarmatus*.
      Posterior femora male toothed at tip.
        Clypeus hemihexagonal, margin single; vertex with a short moderately elevated transverse carina............**striatus.**
  Mentum broader than long, not narrowed in front, anterior angles broadly rounded, surface not impressed, apex arcuate.
    Males unknown.
      Clypeus hemihexagonal, margin single; vertex with an acute moderately elevated tubercle.
        Thorax much shorter than any other species, mandibles more prominent, angles of labrum prolonged laterally..**sparsus.**

In the table it will be noticed that certain species are described as having a double clypeal margin while in others it is single. In the former case a distinct margin is seen above that to which the labrum is attached as in *Elater*. This margin is thickened in *musculus* and forms the anterior ridge of which mention is made.

Having devoted so much space to the description of the special characters of the species, and the synoptic table containing nearly every character of moment, but little now remains except the bibliography and synonymy.

O. pectoralis, Lec., Trans. Am. Ent. Soc., 1868, p. 51.—Color ferruginous brown. Head roughly sculptured by coarse indistinctly limited punctures. Thorax with rather sparsely placed granules (denser in front), each bearing a short hair, median line distinct at base only. Elytra rather deeply striate, striæ not closely punctured, intervals slightly convex, irregularly triseriately punctured, each puncture bearing a short seta. Body beneath sparsely but rather coarsely punctured, sparsely hairy. Pygidium nearly smooth. Length .26 inch; 6.5 mm.*

The two specimens before me, both males, have the tip of the elytra distinctly sinuate, the sutural angle dentiform. The first joint of hind tarsi longer than all the others together, stout and arcuate, the second joint longer than the two following (which are equal) together. The prosternum is lobed in front.

---

* The measurements of the present paper are taken from the apical margin of the thorax to the tip of the elytral suture.

Occurs in Arizona and New Mexico.

O. musculus, Say, (*Bolboceras*), Bost. Journ. I., 178; *opacus* ♀, Lec., Trans. Am. Ent. Soc., 1868, p. 51; *americanus*, Westw., Trans. Ent. Soc., Lond., Ser. II., 2, p. 66.—Ferruginous brown, becoming paler. Head coarsely punctured, clypeus with double margin, the upper forming an arcuate carina, a feeble transverse carina on the vertex. Thorax sparsely punctured in male, more densely in the female, median line extremely indistinct even at base. Elytra striate, striæ punctured moderately closely, intervals moderately convex, irregularly tri- or externally biseriately punctured, the punctures denser in the female; sutural angle rectangular. Body beneath sparsely punctured and hairy. Length .20—.22 inch; 5—5.5 mm.

I have united *opacus* with *musculus*, although they differ somewhat in the sculpture of the upper surface, for the reason that they both agree in the sculpture of the head, and all the specimens known of the former are female and all of the latter male. The sculpture varies in density in the two males before me.

Westwood describes the clypeus as biangulate, but the figure shows the ordinary hemihexagonal form of this and several other species. I think there is no doubt of the synonymy.

Occurs in Michigan, Dakota and Nebraska.

O. simplex, Lec., Proc. Acad., 1854, p. 222; Trans. Am. Ent. Soc., 1868, p. 51.—Resembles the preceding in form but the sculpture is denser, the striæ of the elytra less deep and the intervals flatter. The clypeal margin is double, but the upper line is not thickened and it follows the hemihexagonal outline of the margin. Median line of thorax very slightly evident at base. Body beneath sparsely punctured, more densely punctured along the middle of the abdomen. Length .20—.26 inch; 5—6.5 mm.

Occurs in Colorado, Nevada and New Mexico.

O. Ulkei, n. sp.—Ferruginous brown, moderately shining. Head moderately punctured, clypeal margin double, the upper line not thicker, front not carinate. Thorax moderately densely granulato-punctate, median line moderately deeply impressed at basal third. Elytra finely striate, striæ very finely punctured, intervals nearly flat, irregularly triseriately sparsely punctured. Body beneath sparsely punctured and pilose. Length .20 inch; 5 mm.

This species resembles superficially the preceding, and differs especially in the sexual characters of the male as shown in the table.

One specimen, Nevada. Cabinet of Mr. H. Ulke.

O. biarmatus, Lec., Trans. Am. Ent. Soc., 1868, p. 51.—Ferruginous or brownish testaceous. Head sparsely punctured, clypeal margin arcuate, double, the upper ridge elevated at each end into a small tubercle ♂ or flat ♀. Thorax moderately densely punctato-granulate, median line distinctly impressed at ral third. Elytra rather deeply striate, striæ closely punctate, intervals nvex, moderately densely punctulate. Body beneath sparsely punctate. ngth .14—.20 inch; 3.5—5 mm.

Occurs in Texas and New Mexico.

O. frontalis, Lec., New Species, p. 76; Trans. Am. Ent. Soc., 1868, p. 51; *omplex,* Lec., loc. cit., p. 51.—Color as in *musculus.* Clypeus hemihexagonal, argin single, an acute tubercle near the frontal suture; front coarsely and eeply punctured and with a moderate transverse ridge. Thorax moderately ensely punctato-granulate, a slight impression near each side, median line oderately deeply impressed at basal half. Elytra striate, striæ with rather oarse punctures, intervals feebly convex, moderately regularly bi- and triseriately punctulate. Body beneath very sparsely punctulate. Length .20—.26 nch; 5—6.5 mm.

I have united *complex* with *frontalis* as it has all the essential haracters. The front however was described as having three apical tubercles, two of which are represented by a darker spot such as occurs in every species at the end of the frontal suture. The posterior and anterior femora of the male have a small acute tooth at middle which may entirely disappear in less developed specimens.

Occurs from Texas to Florida.

O. striatus, Lec., Proc. Acad., 1854, p. 222; Trans. Am. Ent. Soc., 1868, p. 51.—Size, color and sculpture of *musculus.* Clypeus broadly hemihexagonal, margin single, vertex with a short transverse carina. Median line of thorax rather deeply impressed at basal half. Length .20—.22 inch; 5—5.5 mm.

Occurs in New Mexico and Arizona.

O. sparsus, Lec., Trans. Am. Ent. Soc., 1868, p. 51.—Similar to the preceding but with the thorax relatively shorter. Clypeus hemihexagonal, margin single, head sparsely punctured, and with a moderately prominent acute vertical tubercle. Thorax sparsely punctured, median line moderately deeply impressed at basal half. Elytra striate, the inner striæ with coarse, the outer with fine punctures, intervals slightly convex very sparsely punctulate. Body beneath sparsely punctulate. Length .18—.22 inch; 4.5—5.5 mm.

Occurs in New Mexico and Colorado. Females only known.

I am unable to identify the following species.

O. duplex, Lec., Trans. Am. Ent. Soc., 1868, p. 51.

Of this insect I can find no type, and I have seen nothing corresponding with it. I have suspected that it might be a well marked *opacus*, but I do not find any specimens of this from Texas.

MACRODACTYLUS, Latr.

Several important characters appear to have entirely escaped notice, and the species although few in number are in a somewhat confused state.

The antennal club does not differ notably in length between the two sexes.

The pygidium is always much longer in the male, the form being elongate oval in the one case and broadly triangular in the other.

The anterior and posterior tibiæ of the male are without spurs. There are however, stiff bristles around the end of the hind tibiæ which simulate spurs, but no proper spurs. The middle tibiæ have two well defined spurs. In the female the tibiæ are all normally provided, that is, the anterior have one and the four posterior two each.

In the male the post coxal portion of the prosternum is elevated in a long and rather slender process, that of the female is entirely flat and without elevation. The abdominal segments 2—5 of the male have on each side of the middle an oblique row composed of three or four coarse punctures, bearing a stiff and nearly erect bristly hair. The females have a few slender hairs usually arranged without any marked regularity.

The claws of the male, especially those of the anterior tarsi, are very much less cleft than those of the female, and are longer and much less curved.

The discovery of the sexual relations of our species has required a rearrangement of the synonymy, and the following notes are the result of their study.

Males.—Anterior and posterior tibiæ without spurs, prosternum behind the coxæ elevated in a long process, abdomen with stiff hairs arranged in oblique rows on each side of the middle of segments two to five, pygidium elongate.

  Thorax always with recumbent pubescence.

    Prosternal process long, slender, as long as the coxæ and visible from the front; abdominal bristles slender.................... **subspinosus.**

    Prosternal process short, not visible from the front; abdominal bristles very short.. **angustatus.**

    Prosternal process long, visible from the front, tip broader and emarginate; abdominal bristles stout................................ **uniformis.**

Females.—Anterior and posterior tibiæ with spurs, prosternum not elevated behind the coxæ; abdomen with a very few slender hairs, pygidium triangular.

  Thorax with recumbent hairs with short vertical setæ intermixed, abdomen with very few median erect hairs.................. **subspinosus.**

  Thorax with all the hairs of the disc erect, those of the margin recumbent, abdomen with many erect hairs along the middle arising from strong punctures.. **angustatus.**

  Thorax with the hairs all recumbent as in the male, abdomen with few erect hairs arising from small punctures........................ **uniformis.**

M. subspinosus, Fab.

Females of this species very rarely occur with the pubescence of the thorax flat as in the male, they then resemble *uniformis* which has however, a denser and longer pubescence especially on the elytra. The prosternal process of the male is as long as the coxæ, arcuate and compressed. The abdominal setæ are rather slender when compared with those of the two following species. In both sexes the elytral vestiture is not dense and there are no erect hairs. The male has a more slender form than the female.

This species occurs especially in the Northern States, northward of a line from Virginia to Colorado.

M. angustatus, Beauv., *setulosus,* ♀, Lec.

The male is a larger insect than the preceding. The prosternal process is short, but little longer than half the coxæ. The abdominal setæ are long and stout. The female has the hairs of the disc of the thorax erect, those of the margin recumbent; the elytra have also erect hairs near the base. The abdominal segments 1—5 have large punctures, varying in number from 4 to 8—10 according to the segment, which give rise to moderately long hairs, while in *subspinosus* these hairs are entirely absent or very inconspicuous.

This species occurs in the Gulf States, but I have seen one female from Pennsylvania.

M. uniformis, n. sp.

Resembles the two preceding in form and differs superficially in the denser and longer vestiture. Both sexes have the thorax clothed with recumbent pubescence, and the surface less deeply punctured than in either of the preceding. The abdominal setæ of the male are very stout and stiff, those of the female few in number and on the first four segments only. The prosternal process of the male is long, wider at tip and moderately deeply emarginate. Length .40 inch; 10 mm.

Occurs in Arizona.

Synonymy.

M. subspinosus, Fab., Syst. Ent., p. 39; Oliv. Ent. I. 5, p. 70; pl. 7, fig. 73, a, b; Lec., Journ. Acad., 1856, p. 277, ♂.
  elongatus. || Herbst., Käfer. III., p. 145; pl. 26, fig. 3, ♂.
  polyphagus, Burm., Lamell. IV., 2, p. 57.
  angustatus, Lec., (in part), loc. cit., p. 278, ♂.

M. angustatus, Beauv., Ins. Afr. et Amer. I. 2, p. 30; pl. 5, fig. 6.
  angustatus, Lec., (in part), loc. cit.
  setulosus, Lec., loc. cit., p. 277, ♀.

M. uniformis, Horn, n. sp.

DICHELONYCHA, Kby.

The sexes may be readily distinguished by the structure of the antennæ, the club of the male being nearly as long as the funicle and in the female much shorter. The abdomen viewed in profile from the side is convex along the median line in the female and concave in the male.

The spurs present no special difference in the majority of the species. In three however, (*valida*, *albicollis*, *sulcata*), the outer spur of the male hind tibiæ is broader than the other and truncate at tip, (being less evident in the first than in the other two), while the females of these and both sexes of all the others the spurs are slender, acute and similar.

The frontal suture is normally deeply impressed, but in five the suture although traceable is not impressed.

The thorax bears a median, moderately deep impression in some species, but is even in the greater number. Behind the apical margin and parallel with it, is a moderately deeply impressed submarginal line which is almost entirely obliterated in two species.

In those species with the sulcate thorax, the posterior tarsal claws are either absolutely or very nearly simple, while in all the others the tip is decidedly bifid. The clypeus is usually rounded in front, the margin more or less widely reflexed, two species (*truncata*, *pusilla*), have the clypeus truncate in front, the sides not arcuate and the angles very distinct.

Based on the above characters, the following table of the species will greatly assist in the identification of our species.

- Thorax without median groove.
  - Clypeus not prolonged.
    - Frontal suture very indistinct or entirely obliterated.
      - Sub-apical and basal marginal grooves distinct.
        - Clypeal margin narrowly reflexed. Anterior tibiæ tridentate.
          - Apex of hind tibiæ and tarsi piceous........................**elongata.**
          - Tibiæ and tarsi entirely testaceous........................**subvittata.**
        - Clypeal margin broadly reflexed. Anterior tibiæ sub-bidentate. **canadensis.**
      - Sub-apical and basal marginal grooves obsolete.
        - Sides of thorax posteriorly sinuate, angles distinct............**testacea.**
        - Sides of thorax posteriorly oblique, angles very obtuse........**pallens.**
    - Frontal suture deeply impressed.
      - Clypeus rounded, angles rounded.
        - Thorax with basal marginal line entirely obliterated at middle. Elytra with the punctures nearly obliterated by fine transverse rugæ..**Crotchii.**
        - Thorax with basal marginal line entire and very distinct. Elytra with punctures distinct.
          - Head, thorax and legs very nearly black, elytra brilliant green or bronze, uniform, rarely with pale limb and then very narrow..**Backii.**

Head, thorax and legs rufous, the latter very rarely piceous; elytra with broad pale margin.
Elytra piceous with æneous tinge........................**fuscula.**
Elytra brilliant metallic green..........................**fulgida.**
Clypeus truncate, angles rectangular..............................**truncata.**
Clypeus prolonged in advance of the labrum..............................**clypeata.**
Thorax with a rather broad and deeply impressed median groove.
Disc of the thorax on each side of median line punctured.
Punctures of disc arranged in an even space.
Outer spur of hind tibiæ ♂, very much broader than the inner and distinctly contorted..**albicollis.**
Outer spur of hind tibiæ ♂, somewhat broader, not contorted..**valida.**
Punctures of disc arranged in a broad fovea on each side........**sulcata.**
Disc of thorax very smooth.
Clypeus subtruncate anteriorly, sides not rounded. Hind tibial spurs slender, similar and equal in the sexes..............................**pusilla.**

D. rotundata, Lec., is omitted from the above table, as it appears to constitute a distinct genus.

D. elongata, Fab.—Body beneath, head and thorax piceous. Elytra variable, testaceous or piceo-testaceous with an æneous surface lustre of variable intensity but evenly disposed. Head and thorax densely punctured, the former sparsely pubescent, the latter sparsely pubescent ♂, or densely pubescent ♀. Clypeal margin moderately reflexed, frontal suture very indistinct, not impressed. Scutellum with moderately dense, yellowish white, recumbent pubescence. Elytra rather coarsely punctured, sparsely pubescent. Body beneath sparsely punctured, rather densely clothed with long scale-like hairs. Anterior and middle legs and hind femora yellowish testaceous, hind tibiæ (except at base) and tarsi piceous.

The sub-apical and basal marginal lines are deeply impressed. The hind tibial spurs are both slender and acute in the two sexes. The pubescence of the thorax is always denser and more persistent in the female, and gives it the appearance of a distinct species, especially as the hind angles of the thorax are less prominent. By an examination of those species in which the hind angles of the thorax are well marked, it will be at once noticed that while the males have the thorax sinuate posteriorly and the angles acute, the females have the sides posteriorly oblique, and the angles obtuse or even indistinct. From this it is evident that too great stress must not be laid on the form of the thorax in the attempt to separate species.

This species occurs rather abundantly from Canada to the Middle States.

D. subvittata, Lec.—Color testaceous, elytra with distinct æneous tinge, frequently with a darker vitta extending from the humeral to the apical umbone with the color always more densely æneous at these points. Head rugosely punctured, sparsely pubescent, frontal suture nearly obliterated, clypeal margin narrowly reflexed. Thorax rather coarsely but not densely punctured, median line very feebly impressed, surface sparsely pubescent and similar in the sexes, sub-apical and basal marginal lines deeply impressed. Elytra rather coarsely punctured and wrinkled, very sparsely pubescent. Body beneath sparsely punctured and pubescent. Legs testaceous.

This species differs from the preceding in having the thorax less densely and more coarsely punctured, and similarly pubescent in the two sexes, the hind tibiæ entirely testaceous, and finally by the trifling character of the darker spots at the humeral and apical umbones. It is also somewhat larger.

Occurs in Canada.

D. canadensis, n. sp.—Piceo-testaceous, elytra greenish bronze with margin paler. Head densely and rather coarsely punctured, sparsely pubescent, frontal suture nearly invisible, very strongly arcuate at middle, clypeus with rounded angles, margin deeply reflexed. Thorax sparsely punctured, a slight impression near the middle of the side, sub-apical and basal marginal lines distinct. Elytra coarsely punctured, piceo-testaceous, surface uniformly and rather brightly æneous. Legs entirely testaceous. Anterior tibiæ with the upper tooth obsolete. Body beneath sparsely punctured, and sparsely and finely pubescent. Length .36 inch; 9 mm.

This species resembles *elongata*, but the clypeus has a much more broadly reflexed margin, the thorax less punctured, the hind tibiæ entirely testaceous, and the anterior tibiæ bidentate only.

Occurs in Canada.

D. testacea, Kby.—Pale testaceous, elytra with very faint tinge of æneous. Head coarsely and densely punctured, with very few hairs. Clypeus with rounded angles, margin rather broadly reflexed, frontal suture distinct but not impressed. Thorax sparsely punctured, sparsely pubescent, hind angles distinct but not prominent, anterior sub-apical and basal marginal lines feeble. Elytra coarsely punctured, sparsely pubescent. Body beneath sparsely punctured and pubescent. Legs testaceous.

This species might be mistaken for a pale *elongata*, but the thorax is much less densely punctured, and the hind angles of the ♂ thorax less prominent. The punctures of the thorax are finer than in *subvittata*, and there is no trace of the median line as in the latter species. The clypeus is rather more widely reflexed than in either of the two mentioned, though less so than in *canadensis*, from which it also differs in the tridentate anterior tibiæ.

Occurs in Canada and Vermont.

D. pallens, Lec.—Pale testaceous above and beneath, elytra with very faint tinge of æneous. Head very densely and coarsely punctured, very sparsely pubescent, frontal suture obsolete. Clypeus with rounded angles, margin very feebly reflexed. Thorax rather coarsely punctured, punctures at the sides denser and sub-confluent, sides behind the middle oblique, angles obtuse, surface sparsely pubescent. Elytra coarsely but sparsely punctured, finely rugulose. Body beneath sparsely punctured and finely pubescent. Legs testaceous.

This species, of which I have seen but one female, resembles the preceding, but is shorter and more robust, and with the margin of the clypeus very narrowly reflexed. The basal and sub-apical lines are still more obliterated.

One specimen, California, (Leconte).

D. Crotchii, n. sp.—Form slender as in *subvittata*, color rufo-piceous, elytra bright metallic green with very narrow pale border, legs testaceous or rufo-testaceous. Head piceous, clypeal margin paler, surface moderately densely punctured, sparsely pubescent, frontal suture impressed, clypeal margin moderately reflexed. Thorax piceous, form of *subvittata*, moderately densely punctured, sparsely pubescent, sub-apical line feebly impressed, basal marginal line nearly obsolete. Elytra rather finely punctured, punctures nearly obliterated by the fine transverse wrinkles, surface finely pubescent. Body beneath piceous, sparsely pubescent. Legs testaceous or piceo-rufous. Legs and form of *subvittata*.

This species begins a small series, the members of which are extremely difficult to separate in description. The present species is more especially distinguished from those which follow, by the elytral sculpture and the feeble marginal thoracic lines. At first sight the elytra will be seen to present a much less shining surface.

Several specimens were collected by myself in the high Sierras of California, and others subsequently by my lamented friend G. R. Crotch, in whose memory it is named.

D. Backii, Kby.—Head, thorax, body beneath and legs nearly black, elytra bright green or bronze, with at most a very narrow paler margin. Head black, moderately densely and coarsely punctured, frontal suture impressed, clypeal margin narrowly reflexed. Thorax moderately densely punctured, especially at the sides. Elytra coarsely but not closely punctured. Body beneath sparsely pubescent and punctured.

Specimens of this species rarely occur with the elytra more or less testaceous, these must be considered partially immature, the thorax is however always black, and the clypeal margin never pale.

Occurs in Canada and northward, also in Utah and Oregon.

D. fuscula, Lec.—Rufo-testaceous, elytra piceo-æneous with moderately broad pale margin. Head moderately densely and coarsely punctured, sparsely pubescent, frontal suture impressed, clypeal margin moderately reflexed. Thorax sparsely but moderately deeply punctured, intervals shining, sparsely pubescent. Elytra piceo-æneous with moderately broad pale limb, surface very coarsely punctured, sparsely pubescent. Body beneath sparsely punctured and pubescent.

Specimens often occur with the body beneath, head and thorax piceous, legs rufo-piceous. The especial characteristics of this species are the sparsely punctured thorax, coarsely punctured elytra and the deep bronze tinge of the surface.

Occurs in the southern Atlantic States from Maryland to Georgia, also in Ohio.

D. fulgida, Lec.—Rufo-testaceous, elytra brilliant green shining with narrow pale limb. Head very coarsely and densely punctured, sparsely pubescent, frontal suture impressed, clypeal margin narrowly reflexed. Thorax rather sparsely but coarsely punctured, sparsely pubescent. Elytra brilliant metallic green, coarsely and deeply punctured, smoother at basal third, surface sparsely pubescent. Body beneath rufo-testaceous, sparsely punctured and pubescent. Legs paler.

I have seen only females of this species. It can only be confounded in description with *fuscula* from which it differs by its larger size, more coarsely punctured thorax and the color of the elytra. Varieties rarely occur with the elytra testaceous.

Occurs in Oregon and Vancouver.

D. truncata, Lec.—Rufo-piceous. Head coarsely punctured, sparsely pubescent, frontal suture deeply impressed. Clypeus truncate in front, sides slightly convergent, angles acute, margin rather broadly reflexed and testaceous. Thorax finely rugulose, sparsely pubescent. Elytra with paler limb, surface bronzed, punctured and coarsely wrinkled. Body beneath sparsely punctured and pubescent. Legs testaceous or piceo-testaceous.

This species which is about the smallest, is easily known by the truncate clypeus and the thoracic sculpture.

Occurs in Colorado, Oregon and California.

D. clypeata, n. sp.—Form robust, color piceous, elytra luteous without metallic lustre. Head coarsely and densely punctured, frontal suture not impressed. Clypeus prolonged over the labrum, rounded in front, slightly dilated at the sides, margin moderately reflexed. Thorax coarsely and densely punctured especially toward the sides, sub-apical line obliterated at middle, basal marginal line feeble, disc moderately convex, sides very obtusely sub-angulate, posteriorly oblique, hind angles obtuse, margin in front crenulate. Elytra luteous without surface lustre, obsoletely tricostate, surface coarsely punctured. Body beneath sparsely punctured, abdomen and sternal side pieces finely alutaceous, surface sparsely pubescent. Legs piceo-testaceous. Length .42 inch; 10.5 mm.

This species has somewhat the aspect of the succeeding group, but has no median thoracic line. The prolonged clypeus will serve to distinguish it at once from all others in our fauna.

One specimen ♀, California. Henry Edwards.

D. albicollis, Burm.—Testaceous or piceo-testaceous, elytra with moderate æneous tinge. Head coarsely and densely punctured, moderately pubescent, frontal suture feebly impressed, clypeus testaceous, margin moderately reflexed. Thorax coarsely but sparsely punctured, a deep median groove, surface sparsely hairy, sides obtusely angulate at middle, posteriorly oblique angles broadly rounded. Elytra faintly piceous with æneous tinge, margin and suture paler, disc faintly sub-tricostate coarsely punctured, sparsely pubescent. Body beneath sparsely punctured, moderately densely pubescent. Legs testaceous, tibiæ and tarsi usually darker.

The males have the outer spur of the hind tibiæ much broader than the inner, truncate at tip and distinctly twisted.

Occurs in the Middle States and Canada.

D. valida, Lec.—Resembles the preceding in form and sculpture and differs as follows:—Head, thorax, body beneath and legs ♂ piceous, ♀ rufous. Elytra brilliant metallic green with very narrow pale margin. Hind tibiæ ♂ with the outer spur very little stouter than the inner, not twisted but obtuse at tip.

Occurs in California and Oregon.

D. sulcata, Lec.—Piceous, elytra deeply bronzed. Head coarsely and densely punctured, frontal suture impressed, occiput with vague chevron-like impression, clypeal margin feebly reflexed. Thorax very sparsely punctured, the punctures being more densely crowded in the median impression, and a vague fovea on each side, surface sparsely pubescent. Elytra coarsely punctured, surface deeply bronzed, sparsely pubescent. Body beneath sparsely pubescent and hairy. Legs testaceous, hind tibiæ and tarsi darker.

In the male of this species, the hind tibial spurs are slender and equal.

Occurs in New Mexico.

D. pusilla, Lec.—Piceo-testaceous. Head rugulose, frontal suture very vague, clypeus subtruncate, sides slightly convergent, margin moderately reflexed. Thorax with fine, very sparsely placed punctures, median groove moderately impressed, surface rather shining, sparsely pubescent. Elytra punctured, sparsely pubescent, surface with very faint bronze tinge. Body beneath sparsely punctured and pubescent. Legs piceo-testaceous, hind tibiæ and tarsi darker.

In both this species and the preceding, the pubescence has a silken aspect. The hind tibial spurs are slender and similar in the sexes.

Occurs in California.

Bibliography.

D. elongata, Fab., Ent. Syst. I. 2, p. 170; Lec., Journ. Acad. 1856, p. 279.
    elongatula, Schonh., Syn. Ins. I. 3, p. 210.
    linearis, ♀, Gyll., Sch. Syn. Ins. I. 3, App. p. 103; Burm., Handb. IV. 2, p. 74; Lec., loc. cit.
    hexagona, Germ., Ins. Spec., Nov., p. 124.
    virescens, Kby., Fauna Am. Bor. IV., p. 134.
    backii, ‡ Burm., Handb. IV. 2, p. 536.
D. subvittata, Lec., loc. cit., p. 279.
    virescens, var. c., Kby., loc. cit.
D. canadensis, Horn, n. sp.
D. testacea, Kby., loc. cit., p. 135; Lec., loc. cit., p. 279.
D. pallens, Lec., Proc. Acad., 1859, p. 283.

D. Crotchii, Horn, n. sp.
D. Backii, Kby., loc. cit., p. 134, pl. 2, fig. 6; Lec., Journ. Acad., 1856, p. 280.
D. fuscula, Lec., loc. cit., p. 281.
D. fulgida, Lec., loc. cit., p. 279.
D. truncata, Lec., loc. cit., p. 281.
D. clypeata, Horn, n. sp.
D. albicollis, Burm., Handb. IV. 2, p. 74; Lec., loc. cit., p. 281.
D. valida, Lec., loc. cit., p. 281.
D. sulcata, Lec., loc. cit., p. 281.
D. pusilla, Lec., loc. cit., p. 282.

CŒNONYCHA, n. g.

This genus agrees with *Dichelonycha* in all respects, except in the following characters.

Head moderately deeply inserted, eyes partially concealed by the anterior angles of the thorax. Thorax without trace of sub-apical, impressed line. First abdominal segment in great part concealed by the coxæ, abdomen apparently with five segments only.

In *Dichelonycha* the head is prominent, the eyes distant from the thoracic angles, the first abdominal segment at least half visible at the sides, and distinctly visible at middle. The antennæ of *Dichelonycha* are nine-jointed.

Three species are referred to this genus, differing especially as follows:

Elytra oblong, body winged. Antennæ ten-jointed........................**rotundata.**
Elytra oval, body with very feeble wings. Antennæ nine-jointed...**socialis.**
Elytra oval, body apterous. Antennæ eight-jointed...................**ovipennis.**

C. rotundata, Lec., (*Dichelonycha*), Journ. Acad., 1856, p. 281.—Form oblong, color brownish testaceous without metallic lustre. Head coarsely and moderately deeply punctured, frontal suture distinct, feebly impressed. Clypeus truncate in front, margin feebly, angles more broadly reflexed and slightly prominent. Thorax rather more than twice as broad as long, sides gradually divergent posteriorly, hind angles very broadly rounded, disc shining, coarsely but sparsely punctured, margin with rather long fimbriæ. Elytra oblong, slightly broader behind, coarsely punctured, slightly rugulose at middle, and with very sparse and inconspicuous pubescence. Body beneath very sparsely punctured and pubescent. Length .32—.40 inch; 8—10 mm.

This species may be known by its ten-jointed antennæ. Its form and general appearance cause it to resemble some of the members of the group *Rhizotrogi.*

Occurs from Oregon to Fort Yuma, Cal., but rare.

C. socialis, n. sp.—Form oblong oval, narrower in front, color brownish testaceous, sides of elytra somewhat paler. Clypeus hemihexagonal, margins reflexed, more broadly in front, anterior edge emarginate, angles moderately prominent, surface roughened by the confluence of large but superficial punctures. Head densely and coarsely punctured in front, gradually more sparsely posteriorly. Thorax twice as broad as long, anterior angles prominent and partially concealing the eyes, sides slightly sinuate in front, rather broadly arcuate at middle, hind angles broadly rounded, surface sparsely punctured and with a few short recumbent hairs; margins fimbriate. Elytra oval, broadest behind the middle, humeri feebly prominent, apex subtruncate, surface very finely alutaceous and sub-opaque, sparsely and finely punctured, each puncture with a very short hair. Body beneath paler than above, sparsely punctured and sparsely hairy. Legs pale testaceous. Length .40—.50 inch; 10—12.5 mm.

The sexes are distinguished by a slightly longer club of the male antennæ. This species agrees with *rotundata* in the form of the clypeus, its form is however more robust, the humeri much less distinct, and the sides of the elytra less parallel. It differs from both species by the number of the joints of the antennæ.

Several specimens were collected by Dr. Edward Palmer, on the island of Guadalupe, on the coast of Lower California.

C. ovipennis, n. sp.—Form elongate oval, color testaceous. Head coarsely but very sparsely punctured, frontal suture distinct, feebly impressed. Clypeus rounded in front, margin moderately reflexed. Thorax twice as broad as long, sides gradually divergent posteriorly, hind angles broadly rounded, surface smooth, sparsely and not coarsely punctured, margins with long fimbriæ. Elytra oval, slightly broader behind the middle, humeri obtusely rounded, surface very sparsely punctate and with inconspicuous pubescence. Body beneath very sparsely punctured and sparsely hairy. Length .30 inch; 7.5 mm.

The apterous body and eight-jointed antennæ serve to distinguish this species. The clypeus also differs considerably in form from *rotundata*.

The third and fourth joints of the antennæ are moderately long and appear to be connate, each one having the appearance of being formed by the fusion of two joints. This will account for the antennæ being eight-jointed in this, and ten-jointed in the preceding species.

I have but one specimen ♀, from Nevada.

The three species present an extremely interesting series, their salient characters being as follows:

C. rotundata, Lec.

Clypeus emarginate and angulate on each side. Antennæ ten-jointed. Elytra oblong, humeri distinct, wings well developed and flexed, adapted for flight.

C. socialis, Horn.

Clypeus as in *rotundata*. Antennæ nine-jointed. Elytra oval, humeri obtuse, wings rudimentary not flexed, and not adapted for flight.

C. ovipennis, Horn.

Clypeus broadly rounded. Antennæ eight-jointed. Elytra oval, humeri obliterated, wings entirely wanting.

TRICHIUS, Fab.

The sexual characters of the species require primary attention. The pygidium of the male is always more convex than that of the female, and the tip somewhat inflexed. This affords the means of distinguishing the sexes at all times.

In *delta* the males have the anterior tibiæ bidentate, in the female tridentate, the anterior tibial spur is less developed in the male, and the hind tibiæ of the same sex have a small obtuse tooth at the middle of the inner side. The middle of the posterior margin of the fourth ventral segment is elevated in the male and flat in the other sex. This species has been separated by Burmeister, and with its congeners named *Trigonopeltastes*. The tibial differences in the sexes form the characters of the genus which may for convenience be continued.

The other species of *Trichius* have the tibiæ similar in their dentation in the sexes. *T. piger* and *texanus* have no anterior tibial spur in the male, while it is always present in the males of the other species, although much feebler in the males than in the females.

In *bibens* and *viridulus* the females have the pygidium sinuate on each side near the tip, the tip being truncate. This sinuation is hardly observable in the males.

These characters reduced to the tabular form give the following result:

Anterior tibiæ similarly dentate in the sexes. (Trichius.)
Anterior tibiæ ♂ without spur.
Body beneath and pygidium rufous; anterior tibiæ ♂ moderately stout. **piger.**
Body beneath and pygidium black; anterior tibiæ ♂ with inner edge very broad.. **texanus.**
Anterior tibiæ ♂ with spur, more slender and straight than in the ♀.
Pygidium oval at tip in both sexes. Elytra with lateral velvety space.
Third and fifth elytral intervals subcostiform; two oblique white fasciæ. **affinis.**
Pygidium sinuate on each side and truncate at tip. Elytra without lateral velvety space, intervals equal.
Elytra orange red with tinge of æneous.............................. **bibens.**
Surface brilliant metallic green.. **viridulus.**
Anterior tibiæ dissimilarly dentate in the sexes. (Trigonopeltastes.)
Thorax with reversed deltoid mark... **delta.**

T. piger. Fab.—Head and thorax densely punctulate, sparsely clothed with short, yellowish, erect hairs, surface slightly tinged with green. Elytra rufous or rufo-piceous, third and fifth intervals more convex, subcostiform, second and fourth intervals moderately densely punctate, moderately hairy; two white fasciæ one slightly in front of, the other slightly posterior to the middle, extending obliquely forward from the margin, attaining the fifth, rarely the third interval; a space of velvety aspect, exterior to the fifth interval and posterior to the forward band and divided by the posterior. Body beneath and femora piceous with æneous tinge, clothed with long white silken hairs. Abdomen, pygidium, tibiæ and tarsi, rufous. Pygidium with alutaceous surface clothed with short hairs at middle, at sides frequently a white scaly space with longer hairs.

The male has no anterior tibial spur, and the tibia at tip is very obliquely truncate, the inner face being moderately broad.

This species occurs more especially in the Northern States as far west as Missouri.

T. texanus, n. sp. (Candeze mss.)—Body above and beneath black, shining. Head densely punctulate. Thorax moderately densely punctured, and with the head, clothed with short erect pubescence. Elytra with intervals three and five more elevated and smoother, two and four flat, moderately densely punctured and pubescent; two oblique white bands and lateral velvety spot as in *piger*, frequently also a subscutellar short white line, and another on the second interval. Pygidium alutaceous pubescent, a white space on each side. Body beneath and legs black, moderately hairy. Similar in size to *piger*.

The male has the anterior tibiæ very stout, the inner face broad and without terminal spur. The thorax equally punctured and with whitish hairs. The pygidium is much less conspicuously pubescent than in the female.

The female has the thorax more coarsely punctured and a smoother space within each hind angle. The angles have a narrow white space on each, and the hairs are longer than in the male and yellowish. The pygidium is also more densely hairy, the hairs yellow and longer than in the male.

In both sexes the thorax is less densely punctured than in *piger*.

Occurs in Texas and Florida.

T. affinis, Gory.—Body above and beneath and legs black, with slight tinge of bronze, disc of elytra usually paler. Head moderately densely, thorax sparsely punctured, sparsely pubescent. Elytra with intervals three and five slightly more convex, two and four very sparsely punctured; two white bands, subsutural white line and velvety space as in *texanus*. Pygidium with lateral white space moderately densely alutaceous and pubescent. Usually smaller than *piger*.

Resembles *piger*, but with a smaller and less punctured thorax, and differs especially in the sexual characters and the very sparse punctures of the second and fourth elytral intervals.

In the female the pygidium is slightly flattened near the tip.

Occurs from Canada and New Hampshire to Georgia.

T. bibens, Fab.—Body above, beneath, and legs bright metallic green, elytra rufo-testaceous with slight æneous lustre. Head densely punctured. Thorax more coarsely but less densely punctured, clothed with short erect hair.

Elytra with intervals very nearly equal, the second and fourth more densely punctured and hairy. Body beneath moderately hairy. Pygidium punctured and alutaceous, moderately hairy, with narrow lateral white space.

The male has a slender, straight anterior tibial spur. The pygidium of the female is distinctly sinuate on each side near the tip, and the tip truncate. There are no oblique transverse bands on the elytra and no trace of them, and no lateral velvety space.

This species is especially abundant in Virginia, rarely occurring north of there, although extending its habitat toward the Gulf States.

T. viridulus, Fab.—Entire surface brilliant metallic green. Head sparsely and finely, thorax more coarsely punctured, sparsely clothed with short erect hair. Elytra with intervals equal and nearly equally punctate. Pygidium coarsely alutaceous. Body beneath sparsely pilose.

This species more nearly resembles *affinis* in form. The elytra with, at most, mere traces of the transverse bands but no lateral velvety space. The pygidium of the female is very decidedly sinuate on each side near the tip, and the tip truncate. Both sexes have anterior tibial spurs, that of the male more slender and straighter than the female.

The color is apt to vary somewhat, the green becoming dark blue, in which case the elytral bands are somewhat more evident.

Occurs in the Gulf States.

T. (*Trigonopeltastes*) **delta,** Fab.—Clypeus sparsely punctate and hairy, hairs recumbent; front velvety black, a transverse band of yellow scales between the eyes. Thorax velvety black, entire margin and reversed delta yellow, covered with scales and with very short hairs. Elytra with rows of indistinct punctures, intervals equal, color orange or paler with black markings arranged as follows; an oblique band extending from the humeri toward the middle of the suture and prolonged parallel with the latter, a triangular space exterior to this; also a subscutellar short yellow line. Scutellum yellow, divided. Pygidium densely clothed with yellow scales, sparsely pubescent, tip and median line usually abraded. Body beneath densely clothed with yellow scales and sparsely hairy. Legs rufous with very few scales, hind tibiæ and tarsi darker.

The elytral markings are subject to extreme variation, that above described being the typical form The sexual characters have already been noticed.

Occurs from Delaware to Texas.

GNORIMUS, Lep.

In this genus the sexual distinctions are also well marked. In the male the pygidium does not differ essentially in form from that of the female, there is however on each side a vague longitudinal impression. The middle tibiæ of the female are straight, those of the male are more slender at base and very suddenly flexed or arcuate. The anterior tibial spur is stouter in the female.

G. maculosus, Knoch.

Occurs in the Middle States and Canada.

Bibliography.

TRICHIUS, Fab.

T. piger, Fab., Syst. Ent., p. 40; Gory et Perch. Mon., p. 89, pl. 10, fig. 5, Schaum, Ann. Fr., 1849, p. 292.
Drummondi, G. et P. Mon., p. 88, pl. 10, fig. 4.
rotundicollis, Kby., Fauna Am. Bor. IV., p. 138, ♀.

T. texanus, Horn, n. sp.

T. affinis, G. et P. Mon., p. 93, pl. 11, fig. 1; Schaum, loc. cit., p. 293.
bibens, ‡ var. d Burm., Handb. III., p. 275.
mutabilis, Schaum, Ann. Fr., 1844, p. 400, pars.
piger, ‡ var. b Schaum, Germ. Zeitschr. II., p. 413.
variabilis, var. a Schaum, Germ. Zeitschr. III., p. 240.
assimilis, Kby., Fauna Am. Bor. IV., p. 137.
viridans, Kby., Fauna Am. Bor. IV., p. 137.
bistriga, Newm., Ent. Mag. V., p. 170.

T. bibens, Fab., Syst. Ent., p. 49; G. et P. Mon., p. 93, pl. 11, fig. 2; Burm., Handb. III., p. 754.
bidens, Ol. Ent. I. 6, p. 62, pl. 10, fig. 87.

T. viridulus, Fab., Syst. App., p. 820; G. et P. Mon., p. 94, pl. 11, fig. 3; Schaum, Ann. Fr., 1849, p. 293.
lunulatus, Fab., Syst. Ent., p. 41; G. et P. Mon., p. 90, pl. 10, fig. 6.
bibens, ‡ var. b Burm., Handb. III., p. 755.
mutabilis, Schaum, Ann. Fr., 1844, p. 400, pars.
variabilis, var. b and c, Schaum, Germ. Zeitschr. III., p. 240.
virens, Linn., Syst. Nat. Ed. Gmel. I. 4, p. 1584.

T. delta, Forst., Cent. Ins. I., 1771, p. 7; G. et P. Mon., p. 91, pl. 10, fig. 7; Burm., Handb. III., p. 748.

GNORIMUS, Lep.

G. maculosus, Knoch, Neu. Beytr., p. 109, pl. 2, fig. 2; Burm., Handb. III., p. 727; Schaum, Ann. Fr., 1849, p. 291.
Bigsbyi, Kby., Fauna Bor. Am. IV., p. 136.
dissimilis, G. et P. Mon., p. 102, pl. 2, fig. 6.

Notes on the COLEOPTEROUS fauna of Guadalupe Island.

BY GEORGE H. HORN, M. D.

The small collection of Coleoptera to which these notes refer, was made by Dr. Edward Palmer, during the spring and early summer of 1875, who at the same time collected a full representation of the flora of the island. The island of Guadalupe is in the Pacific Ocean about one hundred miles westward of the coast of the peninsula of Lower California, and (from the maps) slightly N. W. of the point of crossing of the 28° North and 118° West, and is therefore bathed in the Alaskan current which renders the climate of the western coast of North America as far south as the extremity of the Californian peninsula cold and foggy during the greater part of the year.

The similarity of the climate of the regions immediately adjacent to the ocean, causes a remarkable unity of fauna as far as Coleoptera are concerned, and numerous species extend their range from Alaska to Cape San Lucas, while others extend over large portions of the same region. The islands adjacent to the coast are exposed to the same climatic influences and the fauna should therefore be entirely similar, and as far as the islands have been explored comparatively few new species have been discovered, and on Guadalupe island alone has a new genus been discovered. The species of Coleoptera with few exceptions belong entirely to the fauna of California proper, and are in no way allied to that of Lower California.

The faunal (Coleopterous) regions of the west coast of North America are worthy a few notes in this place. The cold Alaskan current of which mention has been made influences the fauna of the regions adjacent to the coast, this may be called one faunal region, extending with a slight interruption at San Diego, from Alaska to Cape San Lucas. The range of mountains adjacent to the coast in this entire extent limits the region to the eastward. The great central valley of California extending northward into Oregon, limited on the west by the coast range and on the east by the Sierra Nevada with a southern limit near Fort Tejon, forms a tolerably well marked faunal region. The San Diego region extends southward along the eastern side of the peninsula of California, eastward into Arizona and to the north (east of the Sierra Nevada) to Owen's Valley, and following the Colorado river indefinitely toward Nevada and even into Utah. Northern and eastern Oregon and Washington Territory appear to be a middle ground on which we find species from Hudson's Bay, California, and the north-western great plains regions with a moderate number of peculiar species.

The flora of Guadalupe has yielded results entirely similar to that indicated by the small series of Coleoptera before me, and an excellent paper by Sereno Watson has been published, (Proc. Amer. Acad. Arts and Sciences, vol. xi.), giving the results of the study of one hundred and ten phænogamous plants, and as far as the distribution of insects and plants is capable of comparison, there is a striking similarity in the relationships of the species which are truly Californian and those peculiar to the island itself.

The following list of species shows also the various regions from which they were previously known.

List of Species.	*Previously known from*
Calosoma semilæve, Lec.	California, Lower California, Arizona.
" **Palmeri,** n. sp.	
Calathus obscurus, Lec.	California, (San Diego).
Platynus maculicollis, Dej.	Oregon, Cal., Lower Cal., Arizona.
Amara insignis, Dej.	Oregon, California.
" **californica,** Dej.	Oregon, Cal., Lower Cal., Arizona.
Anisodactylus piceus, Mén.	" " " "
Anisotarsus flebilis, Lec.	Lower California.
Bradycellus nebulosus, Lec.	California, Texas.
Bembidium striola, Lec.	Oregon, California.
Necrophorus nigrita, Maun.	Alaska to California.
Dermestes vulpinus, Fab.	Cosmopolite.
Trogossita virescens, Fab.	United States, Lower California.
Saprinus lugens, Er.	United States, Mexico.
Cœnonycha socialis, n. sp.	Trans. Am. Ent. Soc., 1876, p. 192.
Cardiophorus luridipes, Cand.	California.
Pristoscelis pedalis, Lec.	Santa Catalina Island.
Corynetes rufipes, Fab.	Cosmopolite.
Atimia dorsalis, Lec.	California, Vancouver.
Cœlotaxis (n. g.) **muricata,** n. sp.	
" " **punctata,** n. sp.	
Conibius seriatus, Lec.	California.
Helops Bachei, Lec., *var.*	California, (Santa Barbara Island).

An inspection of the above list of twenty-three species shows that the very large majority occur also in the California fauna, two are cosmopolitan, four are entirely new and probably peculiar to the fauna of Guadalupe Island, one was previously known from Lower California only, and two peculiar to the islands near the coast of California.

Calosoma Palmeri, n. sp.—Black, shining. Body feebly winged. Antennæ piceous, fourth joint slightly shorter than the fifth. Mandibles sparsely punctured with coarse and fine punctures intermixed. Head nearly smooth, with scarcely visible transverse wrinkles and very minute punctures. Thorax nearly twice as wide as long, base broader than the length and not emarginate, sides moderately arcuate and converging posteriorly, margin very narrow, not reflexed, hind angles obtuse, basal impressions moderately deep, median line very fine; surface extremely finely transversely wrinkled, and with very few punctures near the basal margin. Elytra obovate, humeri broadly rounded, sides moderately arcuate, disc moderately convex, obsoletely substriate, striæ very indistinctly punctured, intervals 4—8—12 with very indistinct larger punctures. Body beneath black, shining, smooth or obsoletely transversely wrinkled. Length .74 inch; 19 mm.

Male.—Anterior tarsi with three joints dilated and pubescent, fourth joint glabrous.

This species should be referred to the same group with *triste*, etc., (Group iv., Lec. Proc. Acad., 1862, p. 53), from all of the species of which it differs by the thorax being narrowed behind and the base narrower than the apex; the elytra are also obovate in the present species and oblong oval in all the others. The body in *Palmeri* is feebly winged, and in the others (except *Haydeni*) the wings are fully developed. In the latter species the elytra are connate, and I have been unable to detect traces of wings.

Numerous specimens were collected on Guadalupe Island by Dr. Edward Palmer, to whom I take great pleasure in dedicating it. Specimens were sent by me to my friend M. Aug. Sallé of Paris, who informs me that there is nothing in the fauna of Mexico with which it may be compared.

CŒLOTAXIS, n. g.

Mentum small, trapezoidal, emarginate in front, ligula exposed. Maxillary palpi moderately long, last joint elongate triangular, rounded at tip. Labrum small, moderately prominent, clypeus emarginate at middle. Antennæ nearly as long as the head and thorax, third joint longer than the fourth. Anterior tibiæ truncate at tip, outer angle not prolonged, outer edge finely spinulose; tarsi nearly as long as the tibia, first joint prolonged beneath the second and partially or entirely concealing it. Abdominal segments entirely corneous, intercoxal process narrow, triangular. Metasternum short, body apterous. Margins fimbriate.

The affinities of this genus are with *Coniontis* and its allies, combining especially the characters of that genus and *Cœlus*. The differences among the genera of Coniontini may be expressed in the following manner:

Anterior tibiæ simple...**1.**
Anterior tibiæ with outer angle prolonged...**2.**
  1.—Antennæ nearly as long as head and thorax; third joint long...............**3.**
    Antennæ very short; third joint not longer than the second...................**4.**
  3.—Anterior tarsi slender, first joint moderately long and simple..**Coniontis.**
    Anterior tarsi stouter, first joint prolonged beneath the second..**Cœlotaxis.**

4.—Anterior tarsi short, first joint with very long process beneath....**Cœlus.**
2.—Antennæ long and tarsi simple as in *Coniontis*......................**Eusattus.**

Coniontis is the only genus in which the margins are not fimbriate, and *Eusattus* has the posterior angles of the thorax prolonged.

Two species are known to belong to this genus.

Color piceous, surface slightly shining, elytra sparsely punctured..**punctulata.**
Color ferruginous brown, opaque, elytra with muricate punctures..**muricata.**

C. punctulata, n. sp.—Oblong oval, robust, piceous, moderately shining. Head moderately densely punctured, with extremely minute punctures intermixed. Antennæ pale castaneous, last four joints paler. Thorax moderately shining, moderately densely punctured, especially toward the sides, intervals with extremely minute punctures. Elytra less densely but more coarsely punctured than the thorax, obsoletely rugulose. Prosternum coarsely punctured, side pieces coarsely longitudinally strigose. Body beneath and abdomen sparsely punctured and shining. Epipleuræ smooth, basal third concave. Thoracic and elytral margins fimbriate with short yellowish hairs. Length .40—.56 inch; 10—14 mm.

The general appearance of this species is not unlike *Coniontis lata*, Lec., its form being almost precisely identical.

C. muricata, n. sp.—Oblong oval, robust, ferruginous brown, opaque. Head densely and moderately coarsely punctured. Thorax densely punctured, punctures denser and coarser at the sides, each puncture bearing a short yellowish hair. Elytra opaque, sparsely muricately punctured, each puncture with a short erect hair. Prosternum sparsely muricately punctured, side pieces longitudinally strigose, body beneath and abdomen sparsely punctured. Legs ferruginous. Epipleuræ at base concave. Margins of body fimbriate with short yellowish hair. Length .28—.40 inch; 7—10 mm.

This species has nearly the form of *Coniontis obesa.* It differs from the preceding not only by the characters given in the table, but also by the persistence of the hairs of the surface. The two species differ also in the length of the process of the first tarsal joint, in the present species the second joint and a portion of the third are concealed, in the preceding species the second only. It is probable that the punctures of the preceding species bear short scale-like hairs, which are very easily removed, as is the case with some *Coniontis.*

The two species were collected by Dr. Edward Palmer on Guadalupe Island.

Helops Bachei, Lec., Proc. Acad., 1861, p. 353.

Specimens which I am unwilling to separate as distinct from this species, differ in having the elytral striæ more distinctly impressed and the interstitial tubercles less distinct. The specimens are somewhat larger in size but vary in this respect from .32 to .54 inch; 8—14 mm.

Description of new species of DIURNAL LEPIDOPTERA, found within the United States and British N. A.

BY W. H. EDWARDS.

Colias Eriphyle, n. sp.

Male.—Expands 1.7 to 2 inches. ·Upper side canary yellow, very little dusted with black at base of both wings, slightly on costal margin of primaries, and over basal part of cell and of the submedian interspace, on secondaries; the costal margin of primaries immediately at base orange tinted, sometimes decidedly; primaries have the marginal border pale black, thickly dusted with yellow, varying in width from narrow to broad, either crenated within or nearly even edged, curved but slightly at apex when broad, roundly when narrow, extending in either case but a little way along costal margin, projecting a short, excavated spur on inner margin, usually cut to the edge of the wing throughout by the yellow nervules, but sometimes not quite to the edge; these nervules always especially conspicuous on the apical area; discal spot small, black, sometimes containing a few yellow scales, subovate, often almost obsolete, represented by a few black scales only, or by a fine line. Secondaries have the marginal border rather broad, commencing above the upper branch of subcostal and terminating bluntly at the lower branch of median, irregular within, cut by the yellow nervules as on primaries; discal spot small, round, deep orange, rarely accompanied by a second spot, which when present is minute; fringe mixed yellow and roseate.

Under side deep orange yellow, uniform over both wings, except on inner margin and adjoining area of primaries, where the color is pale yellow; both wings usually without the extra-discal series of brown clusters of scales, common to many species of this genus, but sometimes one, two or three minute clusters appear, and rarely a more full series, though in none of the individuals examined, is the series complete; discal spot of primaries very small, black, with a central yellow mark, which varies from a few scales to a streak or even an irregular spot; secondaries have the discal spots pearly white with a few roseate scales, or it is altogether and strongly roseate, ringed narrowly by ferruginous, which occasionally is surrounded by a very pale ferruginous narrow border; in no case does there appear the broad irregular patch about this spot which is characteristic of *Philodice;* very rarely there is a second spot, which is merely a ferruginous point on paler ground; at the outer angle a minute cluster of brown scales, often obsolete; and at base a small roseate patch.

Body above covered with greenish hairs, the collar dull pink; thorax deep yellow beneath, abdomen pale; legs pink; palpi entirely yellow in front, pink at tip and on upper side; antennæ pink, inclining to brown above; club pink with brown scales, the tip yellowish.

Female.—Same size. Upper side of same shade of yellow as the male; sometimes much dusted with black on costal margin of primaries, at base of both wings, and over the larger part of secondaries; but often quite clear, except at base; the marginal border of primaries broad, pale black, much dusted with yellow, partly inclosing a series of large yellow patches; but occasionally these patches are small and then are completely inclosed; the discal spot black, larger than in the male, either rounded or oval. Secondaries sometimes have no border, but usually a narrow one, partly inclosing yellow patches; the discal spot as in male.

Under side either deep yellow or pale greenish white, much dusted; the discal spot as in the male.

Some thirty individuals of this species and of both sexes, were taken at Lake Labache, in British Columbia, by the late G. R. Crotch, and the whole series came into my possession. They were submitted to Mr. Henry Edwards, who pronounced them distinct from any of the Pacific coast species, with which opinion I fully agree. The nearest ally seems to me *Philodice*, and from this they differ in many striking particulars; in the shade of color, being canary instead of sulphur yellow; in the pale marginal border, less advanced on costal margin, cut throughout by the yellow nervules; in the small and often obsolete discal spot of primaries; in the invariably bright orange discal spot of secondaries, which is only occasional in *Philodice;* on the under side in the small discal spot of primaries; in the almost always single spot of secondaries, and which is most often roseate, unaccompanied by a conspicuous border or large patch; and in the absence or obsolescence of the extra-discal clusters, as well as the one at outer angle. The female differs from that sex of *Philodice* in a similar way, in paleness of color, in the discal spots, in the remarkably large patches in the marginal border of primaries; and on the under side the surface is most often immaculate, except for the discal spots.

Mr. Mead brought from Colorado in 1871, a *Colias* very close to this from Lake Labache, and which in Reakirt's paper on the Butterflies of Colorado (Proc. Ent. Soc. Phila., 1867, p. 14), is doubtless the one called *Philodice.* The same form was brought from Montana by Dr. E. Coues, when engaged in the Boundary Line Commission. For the present I shall give no opinion as to these, but they seem to me nearer to *Eriphyle* than to *Philodice.*

I have not a doubt of the blood relationship of all these forms, and, to speak no farther, of every member of the genus, and I see no alternative between lumping them all together, or the holding breeding true to each type to be for all practical purposes a sufficient test of what is called a "good species." There is no sort of assurance that in this, and many similar cases, one form is a variety of the other, that is, has sprung from the other. All have sprung from a common ancestor, from whose type they have one and all departed, and naturally they have inherited many points in common, while they have come to differ in many others. To call one of these forms the parent species and the rest varieties of it, merely because the first chanced to be first described, is assuming what we know nothing at all about, and what may be utterly at variance with the facts. We cannot often breed these forms or from them, but when one prevails in one district and another prevails in another district, and the differences of each are conspicuous, plainly they are breeding each true to its type, and each is entitled in a systematic work to its own designation. They have been varieties, they now are species, that is, permanent varieties, for no man can give a better definition of a species than that. But they are not varieties one of the other, for all that appears.

Argynnis Carpenterii, n. sp.

Male.—Expands 2.5. Upper side yellow fulvous, much obscured at base and over basal half of inner margin of primaries, and over secondaries to the mesial band; both wings bordered by two parallel lines, the space between being fulvous, cut by the black nervules; primaries have a series of black lunules resting on the inner line; on secondaries the lunules are incomplete and do not touch the line; the other markings as in *Cybele;* the mesial band of secondaries narrow, complete; the spot on the arc like the letter C, the basal limb being almost or quite obsolete, the other thick and crossed by a fulvous streak indicating the arc; fringes luteous, black at the tips of the nervules.

On the under side, both wings have a broad marginal border of dead leaf brown, passing into fulvous next inner margin of primaries; primaries yellow brown, clear beyond the disk, tinted with reddish next base and over the inner margin; the subapical patch dark brown; the black markings repeated; in the cell the spot like the letter P inverted has the bend angular, the top square, and the standard cut by a fulvous stripe; the submarginal spots lanceolate, those towards apex brown, and inclosing imperfectly silvered spots; two silver spots on the patch.

Secondaries deep ferruginous from base to the outer side of second row of spots, showing a clear fulvous space on the upper side of the cell; the belt between the outer rows reddish buff, immaculate and not encroached on by the basal color; the submarginal spots large, triangular, edged on all sides by a fine line of black scales, and on the upper side narrowly also by ferruginous; the spots of the second row of rather small size, the first and sixth equal, rounded, the fifth larger, rounded, the second long oval, the third similar but smaller, the fourth minute, the seventh rounded, deeply cleft on the outer side; all these lightly edged above with black, and each projecting a ferruginous shadow on the belt; the third row of four spots, the first on costal margin semi-lunate, the second in cell large, sub-pyriform, cut by a brown stripe, the base circular, the third, in submedian interspace, small, lunate; all these heavily edged with black above; the fourth spot is minute, on inner margin; in the cell a round spot, and at origin of submedian an oval, both in black rings; a small patch at base above cell; shoulder and inner margin lightly silvered.

Body above fulvous, below reddish buff; legs reddish buff; palpi buff, reddish in front and at tip; antennæ fuscous above, fulvous below; club black, fulvous at tip.

Female.—Expands 2.7 inch. Upper side more yellow, the basal portions nearly black, concealing all markings; the marginal lines on primaries confluent and dilated, forming a very broad black border, with which the heavy lunules are also confluent; the spots inclosed by the lunules small, rounded, yellowish next apex, fulvous elsewhere. Secondaries have also a broad black margin, but disclosing fulvous next both angles, the lunules slender. Under side nearly as in the male, the basal area of primaries more red, while that of secondaries is of a darker ferruginous.

From 2 ♂ 1 ♀, taken in New Mexico, above the timber line, by Lieut. W. C. Carpenter, of the Wheeler expedition of 1875.

This species is of the size of *Atlantis*, and is near *Cybele*.

Euptychia Henshawi, n. sp.

Male.—Expands 1.5 inch. Upper side light fuscous, immaculate. Under side of primaries russet, deepest along inner margin, brownish towards costa; crossed by four wavy ferruginous lines, one of which is parallel to the hind margin, midway between cell and margin, one just beyond the cell, and curving around it to costa, the third crosses middle of cell, and the fourth is a demi-line, ending at median nervure; there are also four transverse streaks near base of wing. Secondaries gray-brown, slightly russet-tinted; crossed by two ferruginous lines, the outer one irregular, wavy towards inner margin, shaded on its inner side; the other, nearer base, rather zigzag than wavy; some fine streaks on basal area; the hind margin ashy brown, streaked with dark ferruginous; showing four black eylets, small, equal, placed near the edge of the wing, in pairs on the upper median and next upper interspaces, each with a plumbaginous streak across the marginal side and through the middle, but not reaching quite across; irregular streaks or slight patches of dull silver on the interspaces both toward outer and inner angle; the margin next inner angle edged with ferruginous.

Body above fuscous, beneath gray, the abdomen buff; legs gray; palpi gray, with black hairs in front; antennæ fuscous, imperfectly annulated with whitish; club fuscous above, russet below.

Female.—Expands 1.7 inch. Both wings russet on disk, primaries most brightly, the margins fuscous, as is also costal edge of primaries; on secondaries the eylets of under side are indicated by small dark fuscous spots. Under side as in the male.

From Arizona and New Mexico, collected in 1874, by Mr. H. W. Henshaw, of the Wheeler expedition, in honor of whom I name the species, and in 1875, by Lieut. W. C. Carpenter.

This species is closely allied to the much smaller *E. Gemma*, of the Eastern States.

Thanaos Alpheus, n. sp.

Male.—Expands 1.1 inch. Upper side dark brown; primaries crossed by a series of short black streaks, beyond the disk, running with the interspaces; on each of the two of these next costa a white point; along hind margin an indistinct series of black dots. Secondaries immaculate.

Under side of primaries dark brown with a silky gloss; the white dots repeated. Secondaries dull brown, dusted with whitish scales, and crossed on the disk by a broken row of whitish indistinct small spots, and near the margin by a similar row that quite crosses the wing.

From two examples taken in New Mexico, by Lieut. W. C. Carpenter, in 1875.

Hesperia Comus, n. sp.

Male.—Expands 1 inch. Upper side dark glossy brown; primaries have three pure white, small, equal spots in a vertical row next costa half way between cell and apex; and an oblique row of four minute spots back of and below the cell, the uppermost one beyond the costal row, in the direction of the apex; secondaries immaculate; fringes short, fuscous.

Under side gray brown; the spots repeated; secondaries have a wavy row of six rather large white spots a little beyond the middle of the disk, and nearly parallel with the hind margin; and three equal spots nearer base, one in cell and two on costal margin, the three forming an equilateral triangle.

Body fuscous above, below gray white; legs brownish gray; palpi white; antennæ fuscous above annulated with white, below gray white, not annulated; club dull fulvous above, black and gray below, gray at tip.

From Texas, received from Mr. Belfrage.

Hesperia Nereus, n. sp.

Male.—Expands 1.2 inch. Upper side dark brown, with a greenish tint and silky gloss; primaries have three small, white, elongated equal spots in a vertical row next costa, halfway between the cell and apex; and three other small white spots behind and below the cell, in a line oblique to the others, the first and third of these minute, the second equal to the other two together; fringes long, pale fuscous.

Under side of primaries brown, nearly same as above, but only clear on the inner half, the costal and apical areas being thickly dusted with yellow bronze scales; the spots repeated. Secondaries entirely covered with yellow bronze; beyond the disk a rather zigzag row of small whitish spots or points placed nearly parallel to the hind margin; nearer base three other spots, one in the cell, two on costal margin, and the three forming an equilateral triangle.

Body greenish fuscous above, gray white below; legs gray brown; palpi white yellowish in front; antennæ fuscous, completely annulated with white; club black above, black and white below, tip gray.

From a single specimen, taken at South Apache, in 1874, by Mr. Henshaw.

Hesperia Zampa, n. sp.

Expands 1.2 inch. Upper side pale cinereous, mottled with faint green and dull ferruginous, the latter shade prevailing on secondaries; from the costa of primaries a connected line of small transparent spots crosses the disk nearly to inner margin, and halfway to apex is a demi-line of three similar spots, on the inner side of which is a blackish patch. Secondaries have a pale streak running across the disk almost in line with the discal spots of primaries; fringes cinereous. Under side mottled whitish, brown and cinereous; the markings repeated, and in addition, nearer base of secondaries, are two indistinct stripes, one on middle of the disk, the other on costal margin.

From a single specimen taken at South Apache, Arizona, by Mr. Henshaw, in 1874.

Some years ago Mr. S. H. Scudder undertook to revise the Hesperidæ of North America, and did publish a list of generic names adopted by him, in which the species were allotted to very restricted and therefore very numerous genera. It has remained a bare list however to this day. We have looked for a definition of these genera so that the points upon which they are severally founded might be apparent. In the absence of such definition, it is quite impossible to determine to which genus, under this revisal, a given species may belong, for the generic differences are in many cases evidently scarcely more than specific, or at least, what would be deemed specific by most systematists. I am obliged therefore, in giving names to new species, either to ignore Mr. Scudder's arrangement altogether, which I do not wish to do, provided he will show that they are properly founded, or temporarily and until his definitions appear, fall back on the general designation *Hesperia*, as I have done in this paper. Such genera as Mr. Scudder has indicated, so far as they are undefined, properly have no standing, and can be allowed to claim it merely by courtesy.

Papilio Hippocrates, Felder.

Var. OREGONIA.—In 1873, Mr. Henry Edwards took, on the Columbia River, a single female Papilio, which I can refer only to the Japanese species, *Hippocrates*. It expands 4 inches. Felder describes this species as larger than *Machaon*, the yellow area narrower, the wings narrower and more produced, the hind wings also shorter on the costa and more produced posteriorly; the tails longer, the anal spot more obscurely colored, and joined abruptly to the blue lunule; the black border of the hind wings on the under side broader, the blue spots more distinct, and placed almost in the middle of the black ground, the outer ones accompanied by few yellow atoms, and the cells of both wings longer. And with some exceptions this female agrees well with females of *Hippocrates* from Japan, with which I have compared it. It bears much the same relation to *Hippocrates* as *Aliaska* bears to *Machaon*.

On the Affinities of HYPOCEPHALUS.

BY JOHN L. LECONTE, M. D.

[Read before the National Academy of Sciences, October 10, 1876.]

Among all Coleoptera known to science, there is none which has provoked more discordant expressions of opinion regarding its position and relationships than the genus *Hypocephalus*. In form it is totally unlike any other member of the order, resembling a fat mole-cricket, (*Gryllotalpa*), but with a yet larger prothorax, which equals in length and bulk the hind part of the body. In other characters, as will be seen by the detailed description given below, its affinities are of a very varied and confusing kind, and the opinions at which I have arrived, after a careful study and analysis of its structure, are quite different from those which have been recently expressed. Before proceeding to weigh the value of these details of structure, I shall give a full description of the family and generic characters, in the same form which I have used in other memoirs on the Classification of Coleoptera.

For an opportunity of studying at leisure an excellent specimen of this insect, contained in the Brazilian Exhibit at the Centennial, I am indebted to the courtesy of the Brazilian Commission, and the kind influence of Prof. S. F. Baird.

Family HYPOCEPHALIDÆ.

Mentum transverse, twice as wide as long, rounded at the sides and front, but slightly prominent at the middle; closely connate with the gula by an almost obliterated suture. Gular support of the mentum wide, inclined almost perpendicularly upwards, so as to make a very prominent ridge on the under surface of the head.

Ligula very small and narrow, impressed and hairy in front; bases of labial palpi very large, almost contiguous, and immediately in front of the mentum. Labial palpi three-jointed, nearly as long as the maxillary; condyle of first joint globose, fitting into the supporting piece which is emarginate beneath, separated from the body of the joint by a constriction; body of the joint cylindrical, slightly thicker at the distal end; second joint connected with the first by a small globose condyle; body of second joint constricted at base, then gradually wider to the extremity, which is about twice as wide as the base; third joint triangular, outer side about one-half longer than the inner side; terminal side thick with a reniform spongy surface.

Maxillæ exposed; base large, corneous; lobes small, but separate, ciliate with long hairs; maxillary palpi four-jointed, first joint cylindrical, with large globose condyle, body of joint extending as far as the hairs of the maxillary lobes; second joint also with large globose condyle, as long as the first joint; third joint somewhat shorter, and more dilated externally; fourth joint triangular with a reniform palparium like that of the labial palpi.

Mandibles long, straight on the inner side; broadly bisinuate on the under side, broadly dilated on the outer side into a lobe, extending from the base to the middle; condyle large, immersed in the articulation, so as to indicate the motion to be partly vertical, and partly obliquely outwards; probably by means of powerful muscles, which have their attachment in the large genal processes mentioned below. Antennæ eleven-jointed inserted under the lateral margin of the front, about as long as the mandibles; surface shining, without distinct sensitive spaces; first joint longer, second joint shorter than the others, which are transverse, slightly oblique on the upper side, and only feebly compressed; they are sparsely punctured, and clothed with long coarse hairs; on the anterior face of the fourth and following joints is a semicircular space extending to the tip, which is less shining, and appears to represent the sensitive spaces seen in some other Coleoptera.

Head elongate, deflexed; anterior margin of epistoma feebly trisinuate, slightly produced beyond the condyle of the mandibles; genæ produced perpendicularly downwards into a stout process as long as the mandibles, and connate at the upper end with the front, by a distinct though fine oblique suture, running from the base of the mandible to the front edge of the insertion of the antennæ; side margin of front prominent from the insertion of the antennæ to the middle of the upper margin of the eyes, which are small, oblique, twice as long as wide, and finely granulated. Behind the eyes the sides widen obliquely, and the hind angles extend over the anterior angles of the prothorax; the occiput is convex, but separated from the head proper by a deep curved excavation, the anterior face of which ascends almost perpendicularly to the main surface of the head. Between the eyes there are two shallow impressions, and more anteriorly a still fainter one. On the under surface of the head, besides the transverse ridge behind the mentum, there is on each side a longitudinal ridge below the eye, connected with the side margin of the head, and leaving a concavity of triangular form in front of the eye; there is besides an acute short transverse ridge behind the eye, forming another deep concavity. The gular sutures are obsolete, but the traces remaining diverge strongly behind; the hind part of the neck is marked by two transverse impressed lines. Labrum depressed between the mandibles, elongate-triangular, somewhat emarginate, hairy at the sides and tip, shining, sparsely coarsely punctured and hairy.

Prothorax truncate before and behind, elongate-ovate, about one-third longer than wide, widest behind the middle, more narrowed before than behind; sides distinctly and acutely margined; apex with a marginal line, and a short additional one at the angle; base declivous, feebly margined; under surface with a distinct impressed marginal line, representing the suture between the pronotum and the side pieces; there is, however, no suture between the epimera and episterna; the former pass behind the front coxæ, and unite with the posterior extremity of the prosternum which is narrow, compressed, and perpendicular at tip. In front of the coxæ the prosternum is wide, the sutures are straight, and run from the outer side of the coxæ to the front angles of the pronotum, and there is a narrow triangular excavation on the episterna at that place. The front margin of the prosternum is thick, hairy on the interior edge, deeply emarginate, and armed each side with about six obtuse serrations. The space between the coxæ is concave, and the coxal cavities are rounded, but conspicuously angulated on the outer side, with a large trochantin.

Mesosternum long, extending between the middle coxæ; episterna separated by a very fine longitudinal suture, which is almost effaced as it approaches the coxal cavity; epimera oblique, transverse, not narrowed inwards, and attaining the coxal cavities, of which they form the outer margin; cavities rounded, with an outward prolongation, in which no trochantin is visible.

Metasternum very large; episterna narrow; epimera slightly visible at the outer side of the hind coxæ; hind margin broadly but not deeply emarginate each side, broadly subtruncate between the coxæ, with a small deflexed medial angle; in front of each coxa is a lunate impression.

Abdomen conical, small for the bulk of the insect; of five segments, having the posterior margins straight and prominent. The first is equal in length to the others united, but is excavated almost to the hind margin for the reception of the immense hind coxæ; the intercoxal process is long and narrow, but becomes broader in front, so as to fit to the broad truncation of the metasternum; opposite the medial angle of the latter there is a deep excavation. The intercoxal part of this first segment is channelled in the same manner as the intercoxal parts of the pro- and mesosternum. The second, third, and fourth segments are free and equal in length; fifth, a little longer, triangular, rounded and hairy at tip, adapted to the triangular corneous last dorsal, which is not divided so as to form an anal segment.

I can see but two spiracles each side; they are situated at the anterior side angles of the second and third segments, the others are concealed by the elytra. What can be seen of the dorsal segments seems to be corneous, but I am not at liberty to relax the specimen to make certain my observation.

The elytra cover completely the dorsal segments, and are about as long as the prothorax; they are ovate, narrowed and acutely pointed behind, convex above and coarsely rugosely punctured, in a peculiar manner, which does not resemble the sculpture of any other Coleopteron known to me. There are two faint dorsal costæ on each, which are obliterated, but tend to unite about one-sixth from the tip, and a very faint trace of a third. Outside of these is a much stronger costa, extending nearly to the tip, but united in front with the strongly reflexed but narrow side margin, which is obtusely angulated at the point of junction. The epipleuræ are well defined, and extend to the apex, at the base they are broader and concave, for the reception of the knee of the middle legs. The side margin after uniting with the lateral costa as above mentioned proceeds obliquely inwards to the hind angle of the pronotum, where it ceases; the base of the elytra is declivous, and absolutely without fold; the scutellum is triangular and acute.

Front coxæ separated by the prosternum; globose, with a large trochantin occupying the outer angle of the cavity. Middle coxæ rounded, separated, prominent, without trochantin. Hind coxæ very large, rounded, prominent, separated by the intercoxal process of the first ventral segment.

Legs stout, fossorial. Front thighs thick, unarmed; tibiæ with a medial and apical digitation, and two terminal moveable spurs; tarsi five-jointed; joints one to four triangular; first longer, the others diminishing in size, emarginate at tip, with the angles acutely prolonged; fifth as long as the two preceding, claws rather small, simple; under surface concave, hairy only at the sides. Middle legs just like the front pair, except that they are somewhat longer.

Hind legs remarkably large; trochanter large, on the inner side of the base of the thigh, quadrilateral, with the inner posterior angle acute; thighs very thick, extending to the tip of the abdomen, concave beneath, with a large obtuse tooth on the inner and outer margins of the concavity, nearer the base than the middle. Tibiæ as long as the thighs, rather slender, much curved and twisted, so as to adapt themselves to the inner part of the inferior surface of the thigh in repose; thickened at tip, produced inwards. and armed with a short acute process, but no articulated spurs; terminal surface large, reniform, acutely margined, and clothed with long dense yellow hair; tarsi inserted at the inner side in the emargination of this reniform corbel; quite similar to those of the middle legs, but capable of being folded against the inner side of the tibiæ.

A very slight examination of the combination of characters above described, will show that this insect cannot properly be considered a member of any of the families, or even series of families of Coleoptera, as at present constituted.

A detailed analysis of the systematic value of the structure of the different organs, will show on the other hand, that it is related to several of the series of families; though, as I hope to demonstrate, in different degrees, and in a somewhat different manner to any opinion hitherto offered for consideration.

The mentum is a broad flat plate, not coriaceous in front; the ligula is extremely small and corneous without paraglossæ; these forms occur in several sections of the Coleoptera, especially in the Clavicorn series; at any rate, they do not indicate Cerambycide but rather Clavicorn relationships. The large terminal reniform palparium occurs in almost every genus where the last joint of the palpi is triangular, and does not therefore indicate anything of special import; neither do the small maxillary lobes, which seem to be equally but feebly developed.

The mandibles on the contrary are extraordinarily suggestive. The vertical and outward movements above described are found only in Rhynchophora; where they appear in the Balaninidæ, with purely vertical motion, and in some of the Calandridæ with outward motion. The slight undulation of the lower edge indicates the lower tooth of the normal Rhynchophora, while the broad external lobe represents the upper tooth in the position, in which it would be in several Rhynchophora, if slightly changed by rotation outwards as in Calandridæ, and which it actually has in Rhynchitidæ. The narrow elongate head, inserted into the prothorax by a globose articulation is also suggestive of Rhynchophorous alliances; while the peculiar impressions of the upper and lower surface find their homologies only in Brenthidæ and less accurately in Rhysodidæ and Cupesidæ. The prominence of the gular margin and the close attachment of the mentum is an exaggeration of what is seen in *Eupsalis* ♂, but the presence of two gular sutures is quite inconsistent with a Rhynchophorous affinity. The prolongation of the hind angles of the head, and their coaptation to the slight excavation of the anterior part of the episterna of the prothorax is a singular character, and cannot be used for any purpose of comparison; so far as it goes it indicates a Clavicorn type. The antennæ are remarkable for the simplicity of their form, and the absence of distinct sensitive surface; in this respect they resemble those of *Rhysodes;* but the presence of faint traces of sensitive surface on the front side of the fourth and following joints indicates a power, with slight modification, to represent the structures seen in the Serricorn, Lamellicorn and Clavicorn series; and by a depression of these surfaces into pits the Parandride or Spondylide forms among the Longicorn series may be produced; but I must here observe, that *Scalidia* of the tribe Passandrini, belonging to Cucujidæ, has antennæ which greatly resemble those of *Hypocephalus*, except that the joints are rounded; these organs thus become in *Scalidia* moniliform, as in *Rhysodes.*

The large perpendicular genal processes can be homologized* only with the plates which extend forwards, each side of the mentum, in Passandrini, but being turned downwards, and utilized for the purpose of aiding in the peculiar movement of the mandibles, the base of the maxillæ is of course left exposed.

The prothorax, though margined at the side, is eminently suggestive of the Brenthidæ, both in form and absence of sculpture; the presence of a distinct suture between the pronotum and episterna, conjoined with the complete union, without suture, of the episterna with the epimera, is entirely anomalous, and does not occur in any other genus, so far as known to me. The wide prosternum, and the fine straight lateral sutures are just as in Brenthidæ, but the prolongation of the prosternum backwards is again quite abhorrent to the Rhynchophorous type. The emargination of the prosternum in front is a Rhynchophorous character, but the thickening of the edge and the coarse serrations are unknown in any other genus, and are eminently not Longicorn characters.

The thinning out of the basal edge of the prothorax, and the entire absence of basal fold to the elytra are characters of unfrequent occurrence; the former is perhaps best imitated among the Rhynchophora, the latter in certain Carabidæ of the *Scaritini* tribe.

---

* Westwood, Arc. Nat. 1.35 sqq., has mentioned this homology.

The mesosternum is long, indicating an ancient and undifferentiated type; there is nothing peculiar in the form of the side pieces to indicate any special affinities.

The metasternum is also not remarkable for anything but its great size, and the width of the intercoxal space, characters rather of a Rhynchophorous type, and repeated in members of the Clavicorn series, and in some Cerambycidæ and Chrysomelidæ.

The abdomen though small compared with the bulk of the insect, has the first segment very large. and the intercoxal process which is rather narrow between the coxæ becomes wider in front, in a manner not known to me in any other genus. The coxal cavities are very large, and excavated in great part in the first segment, the anterior angles of which attain the metathoracic epimera; a character, again, which is repulsive to the Longicorn series; the other segments diminish in width, and present nothing very peculiar.

The dorsal segments and the spiracles cannot be seen sufficiently to indicate any relations with other families.

The elytra are altogether peculiar; their sculpture has been compared with that of Spondylidæ and Prionidæ, but I see very little resemblance, though I am not prepared to indicate the exact differences, as the specimen was not in my possession sufficiently long. I may say, however, in general terms, that the surface of the elytra in the different series of Coleoptera is characterized by certain peculiarities, which have not yet been defined accurately, but which a practised eye never fails to detect. So that with sufficient experience, a correct surmise as to the series, (and frequently also the family), from which the wing-case has been derived can be always made. Looking at the elytra of *Hypocephalus* with this view, it is suggestive of no relationship; the punctures, perhaps, feebly resemble those of *Spondylis*, but the costæ, the margin and the epipleuræ are quite as un-Longicorn, as they are unlike every other series that might be named.

The legs, though biologically modified in accordance with the subterranean habits of the animal, are very suggestive of its relationships.

The prominent globose front coxæ, separated by the prosternum, and narrowly but completely enclosed behind, with a large distinct trochantin, occupying an angle in the coxal cavity, are eminently

Clavicorn; without being entirely similar to those of any particular family. By a slight modification in any direction, it might assume the forms observed in that very comprehensive series. The thighs are not remarkable; the tibiæ are quite unlike any Clavicorn known to me, and are feebly suggestive of *Nothopus* (Carabidæ), and *Scaptolenus*, (Elateridæ); the tarsi are Clavicorn more than anything else.

The middle tibiæ by a wonderful anomaly, otherwise unknown in Coleoptera, resemble the front tibiæ, having like them an external digitation and two terminal spurs; the tarsi are like the front pair, but longer.

The hind coxæ are immensely large and prominent, rather Clavicorn in appearance, but without the concavity on the outer side, which is seen in that series, when the coxæ are prominent; they may, perhaps, be better compared with the Rhynchophorous form, though greatly developed and exaggerated; but the position of the coxal cavities, mainly in the first ventral segment, is a character altogether peculiar and unknown elsewhere. The trochanter greatly resembles that of *Necrophorus*, of the Clavicorn series, and the thigh though somewhat peculiar, may be viewed as pertaining to that type. The tibiæ however, by a most curious synthesis, are altogether Rhynchophorous: the form and position of the terminal surface, which is a reniform corbel, is not unknown in other fossorial genera of normal Coleoptera, but the absence of terminal spurs, and the presence of a small fixed spine can be seen only in Rhynchophora. It is also noteworthy, that while the surface of the corbels in normal Coleoptera is always glabrous, and in Rhynchophora sometimes glabrous, and sometimes scaly, but never pubescent, this surface in *Hypocephalus* is covered with a dense brush of fine long hair. The tarsi are similar to those of the other legs.

From the analysis of the characters given above, it is apparent that the thesis already advanced by Spinola* is correct; and that *Hypocephalus* must be excluded from all other families of Coleoptera. I propose to go farther than this, and to maintain the view that it is still more isolated, and represents a fragment of a very old fauna, of which as I have already endeavored to show, *Trictenotoma*, *Cupes* and *Rhysodes* † are remnants, to which also the Brenthidæ, though numerous and perhaps greatly modified in recent geologic times, might be added.

---

* Spinola, *apud* Westwood, Arc. Nat. I., 111. Erichson, Bericht, 1843, p. 30; quoted by Thomson, Fam. Ceramb., 261, I cannot verify this citation.

† Leconte, Notes on the Rhysodidæ of the United States, Tr. Am. Ent. Soc., 1875, p. 162, sqq.

While therefore indicating relationships, not with one, but with several series of the modern Coleoptera, each of these widely distinct forms possesses a certain number of characters in common, or nearly in common, which separate them from all other Coleoptera, and link them together as representatives of the *ancien régime.*

It has been my opinion, expressed many years ago, that by the careful study of the existing forms of insects, which for reasons given elsewhere, both by others and myself, contain a greater number of ancient survivals than any other land animals, these ancient survivals could be recognized and separated; so that we would have by this depuration the evolutions of the present geological age more distinctly separated and defined in our systems of classification; and that we would also be able to ascertain their proper connection (ideal or genetic, or both), with those which existed in past time. I now believe, in addition, that the number of these survivals is so great, that we will have a quite respectable mass of material for the partial reconstruction of the insect-fauna of past ages; especially if studied in connection with geographical distribution. The material which we can expect to gather from this line of study will be much greater than what may be expected from the rocks; in which the fragments, badly preserved for the most part, afford us very uncertain, and usually very modern evidence of little value.

The bibliography of this insect, which is quite voluminous, may be found in the "Essai d'une Classification de la Famille des Cérambycides," Paris, 1860, p. 261; and "Systema Cerambycidarum," Liége, 1864, p. 320, both by Mr. James Thomson, who supports strongly its Longicorn affinities.

For the convenience of those students who may wish to review the opinions expressed by the authors who have written on this subject, I append the bibliography given by Mr. Thomson.

HYPOCEPHALUS ARMATUS Desmarest, Magazin de Zoologie, 1832, insectes, pl. 24, (figure); refers it to *Silphidæ.*

Laporte, Hist. Nat. Coleopt. II, p. 3; places it in *Silphidæ.*

Hope, Coleopterist's Manual, III, p. 149, does the same.

Westwood, Introduction to Modern Classif. Insects, I, 150, refers it and *Calodromus* to Cucujidæ.

Westwood, Arcana Entom. I, p. 35, pl. 10; mentions its complex affinities.

Burmeister, *apud* Westwood, Arc. Ent. I, 37, considers it as a Longicorn.

Guerin, Revue Zoologique, 1841, p. 217, adopts this view.

Le Conte, Journ. Acad. Nat. Sc., Phila., 2d ser., II, 99, knowing the insect only by figure and description, did the same.

White, Proc. Linn. Soc., London, 1854; Annals and Mag. Nat. Hist., 1854, p. 464; asserts its affinities with Prionidæ.

Curtis, Trans. Linn. Soc., London, 1854, p. 227, (figure); considers its strongest relations to be with the Lamellicornia.

Gerstaecker, Bericht, Ent., 1854, p. 80, reviews these two authors, and disapproves of Curtis' view, while he supports Burmeister's, mentioned above.

Blanchard, Hist. Ins., II, 135.

Spinola, *apud* Westwood, Arcana Ent. I, 111; advocates its separation from all other Coleopterous families.

Gistl, Faunus, II, describes it under the name *Mesoclastus paradoxus*, as constituting a new family, Xenomorphæ, a name adopted by Gerstaecker, in the review cited above. The figure given by Gistl is quite incorrect in the form of the legs, and has been supposed to indicate possibly a different species. I think, however, the picture has been only idealized by an artist not trained in the severe discipline of scientific observation. Westwood has given in Arcana Ent. I, pl. 10, an accurate copy of this figure.

Finally, Erichson in Agassiz, Nomenclator Zoologicus, has omitted all reference to either the name or the synonym of this genus.

I must add in justice to those who have investigated previously this subject with such signal ability, that hardly any of the affinities of *Hypocephalus* have been unnoticed by them; the superior prominence, which I have been able to give to its Rhynchophorous characters, is owing entirely to the development of the views regarding the systematic value and classification of that set of Coleoptera, which I have had the honor to present to you at former meetings of the Academy. The opinions first expressed by Westwood, that it belonged to a series connecting *Passandra*, *Catogenus*, and *Rhysodes* with *Calodromus* and the Brenthidæ, agree with those here given, but were overborne by the authority of Burmeister and others, who have maintained the relationship with *Spondylus* and other members of the Longicorn series.

Description of a new species of DACODERUS from the island of Santo Domingo.

BY GEORGE H. HORN, M. D.

DACODERUS, Lec.

D. dominicensis, n. sp.—Castaneous, shining. Head with deep frontal impression; at middle nearly smooth, at sides with coarse elongate punctures; eyes feebly prominent. Thorax longer than wide, sides at anterior third rapidly narrowing, posteriorly very feebly narrowed, at posterior third a sudden and deep constriction, the constriction at sides bridged by an oval tubercle, median line with broad smooth impression, narrower on the posterior third, surface sparsely punctured at the sides. Elytra oblong, base feebly emarginate, humeri obtusely prominent, sides feebly arcuate, disc moderately convex, sutural stria feebly impressed, surface with fine punctures sparsely and irregularly placed, each bearing a very short hair. Body beneath shining, very sparsely punctate. Length .18 inch; 4.5 mm.

The specimens before me are all males, and have a very small brush of hair on the lower edge of the anterior femora near the middle. In the male of *striaticeps*, there is a minute spine.

The differences between the two species are as follows:

dominicensis.	**striaticeps.**
Head.—Smooth at middle, sides with few punctures.	Surface deeply striate.
Thorax.—Sides with few punctures.	Surface deeply striate.
Elytra.—Moderately convex, punctures fine.	Flat, punctures coarse and elongate.
Male.—Anterior femur with small brush of hair.	Anterior femur with minute tooth.

The tarsi and antennæ are both more slender in the Dominican species, and the underside and legs less coarsely punctured.

The occurrence of a species of *Dacoderus* in Santo Domingo, is a curious fact in geographical distribution, and leads us to expect other forms in Mexico. May not this genus be one of the survivals of the period when the islands of the Gulf were continuous with the mainland? It is certainly one of the isolated forms among the Tenebrionidæ.

For this interesting form, I am indebted to Mr. W M. Gabb, whose labors in developing the geology and geography of Santo Domingo, are widely and favorably known.

Synopsis of the species of CYMATODERA and TRICHODES of the United States.

BY GEORGE H. HORN, M. D.

The following paper is presented to the students of our fauna, with the hope that the recognition of our species may be rendered more certain and easy of accomplishment, the descriptions being so widely scattered.

The most recent synopsis was published by Dr. Leconte, (Ann. Lyc. V., p. 15), and contained but seven species. In the meantime, a still greater number have been described, and in the present essay three more will appear.

This great increase in the number of species, has rendered it absolutely necessary to seek for characters to separate them, other than those of color or sculpture, as there are certain forms so nearly alike superficially, as to render it almost impossible to separate them even by comparison, while the descriptions give no certain clue.

The antennæ have given me the means of dividing the genus into six primary groups, five being represented by one species each. Secondarily, the structure of the terminal abdominal segments, ventral and dorsal, are extremely useful. Finally, two species are apterous, although they belong, sexually, with the six species which immediately precede them.

In species six, seven, and eight, in the accompanying table, the last ventral segment is smaller than the last dorsal, so that when viewed from beneath, the edge of the dorsal is visible beyond that of the ventral. In the species which follow, the ventral is large and almost completely hides the dorsal, and its lateral margins are reflexed and partially enclose the pygidium.

In the accompanying table, the division is not in all cases carried to the point of separating the species individually. In these instances, the separation must be based on sexual characteristics, as no description, however detailed, will serve to distinguish the species if the sexual characters are omitted.

With this brief prelude, the reader is referred to the following table:

Antennæ with joints two and three small, round, together shorter than joint four.. **longicornis.**

Antennæ with joints two, three and four equal, and each shorter than any of the following joints.. **puncticollis.**

Antennæ with joint two short, scarcely half as long as joint three....... **Xanti.**

Antennæ with joints two and three conical, equal, together but little longer than joint four.. **usta.**

Antennæ with joints two to ten similar, and nearly equal, joint eleven longer.

Eleventh joint of antennæ elongate, equal to seven, eight, nine and ten in ♂, and to nine and ten in ♀, intermediate joints short... **brunnea.**

Eleventh joint but little longer than the tenth, joints two to ten feebly subserrate and slender.

Body winged, base of elytra broader than base of thorax.

Last ventral segment in both sexes smaller than the last dorsal, and never deeply emarginate in the males.

Last dorsal of male broadly emarginate.

Body black, thorax and legs yellow...................................... **bicolor.**

Last dorsal of male with feeble notch at middle.

Color uniformly dark brown, legs paler........................ **inornata.**

Last dorsal of male with tooth at middle.

Color pale brownish, legs and transverse band of elytra yellowish, testaceous... **fascifera.**

Last ventral segment broader than the last dorsal, the sides of the former reflexed, partly enclosing the latter.

Elytra sinuate at tip, sutural angle prolonged in ♂. Striæ very fine, arranged in pairs, alternate intervals broader..... **californica.**

Elytra rounded at tip. Striæ equidistant.

Legs brown; body brown, elytra with one median transverse band.. { **morosa.** **Belfragei.**

Legs pale testaceous.

Elytra brownish testaceous, with one median transverse, pale band.. { **punctata.** **fuscula.** **oblita.**

Elytra brownish, with several pale, transverse undulating bands, or in great part testaceous.................................. **undulata.**

Body apterous, elytra at base not wider than the thorax.

Elytra gradually broader toward apex, tips rounded....... { **angustata.** **ovipennis.**

C. longicornis, Lec.—Pale brown, basal half of elytra and legs testaceous, surface sparsely pubescent. Head sparsely punctured, eyes large and prominent. Antennæ equal in length to three-fourths the body, joints two to three small, equal, together shorter than fourth, five to eleven gradually increasing in length. Thorax one-third longer than wide, base slightly narrower than apex, in front of middle feebly constricted, behind the middle compressed laterally, disc with few fine punctures and a rather broad ante-scutellar impression. Scutellum emarginate at tip. Elytra at base nearly twice the base of thorax, humeri very distinct, sides nearly parallel, apices conjointly rounded, disc moderately convex, with rows of quadrate punctures becoming feebler to middle, and entirely obliterated behind it. Body beneath nearly smooth, paler than above and sparsely pubescent. Length .26—.32 inch; 6.5—8 mm.

Male.—Fifth ventral slightly emarginate at middle, sixth more deeply and broadly emarginate, wider than the last dorsal, broader than long, narrowed to tip, apex broadly emarginate and with the angles obtuse. (Pl. I, fig. 1).

Female.—Fifth ventral semicircular, flattened at tip, last dorsal semicircular with the margin slightly reflexed.

Occurs at Santa Fe, New Mexico. Utah, (Ulke). The ♀ from Utah is the larger, and has the testaceous space reduced to a large irregular blotch on each elytron.

C. puncticollis, Bland.—Piceous, moderately shining, legs and antennæ brownish, surface sparsely pubescent. Head sparsely punctured, eyes moderately prominent. Antennæ half the length of body, joints two, three and four, obconical, equal, each much shorter than any of the following joints, five to ten equal, eleven somewhat longer. Thorax one-fourth longer than wide, base narrower than apex, feebly constricted in front of middle, strongly compressed at sides behind, disc moderately convex, very sparsely and finely punctured, a feeble ante-scutellar impression; color piceous, basal and apical margins paler. Scutellum cordiform, base with feeble notch. Elytra nearly twice as wide as base of thorax, humeri distinct, sides nearly parallel, apices conjointly rounded, disc moderately convex, with rows of coarse quadrate punctures becoming gradually finer posteriorly, and at apex nearly obliterated, intervals with a row of fine but distant punctures; color piceous brown with narrow ante-median yellow fascia, frequently interrupted at suture and margin, becoming a central spot. Body beneath very minutely and sparsely punctulate, somewhat paler than above, legs ferruginous brown, femora darker at middle. Length .14—.22 inch; 3.5—5.5 mm.

Male.—Fifth ventral arcuate, sixth short, broadly emarginate, as broad as the last dorsal but much shorter, the latter semicircular with a feeble notch at middle. (Pl. I, fig. 2).

Female.—Fifth ventral truncate, sixth short, rounded at tip, last dorsal semicircular.

Occurs from western Texas, through Arizona to Fort Yuma, California, thence through the peninsula to Cape San Lucas. This is the smallest species in our fauna and relatively, with coarser elytral punctures, the intervals between them being very much narrower than the punctures themselves.

C. Xanti, n. sp.—Form moderately robust, pale castaneous, moderately shining, sparsely pubescent. Head finely punctured, eyes moderately convex. Antennæ barely attaining the middle of the body, second joint short, half the length of third, which is but little shorter than the fourth, five to ten equal, subserrate, eleventh longer, acute. Thorax one-fourth longer than wide, wider at apex than base, moderately compressed behind the middle, no ante-scutellar impression, surface finely and sparsely punctate. Scutellum broadly oval, feebly emarginate at tip. Elytra nearly twice as wide as thorax at base, humeri distinct, sides parallel, tips conjointly rounded, disc slightly flattened and with striæ of coarse punctures gradually becoming finer to apical fourth where they become obsolete, intervals rather broad and with one row of fine, distant punctures. Body beneath as above, metasternum sparsely punctured at the sides, abdomen finely and more densely punctate. Legs castaneous. Length .26 ♂—.30 ♀ inch; 6.5—7.5 mm.

Male.—Hind margin of fifth ventral feebly arcuate, sixth short, broadly emarginate, slightly narrower than the pygidium which is nearly semicircular, and prolonged beyond the last ventral. (Pl. I, fig. 3).

Female.—Fifth ventral truncate, sixth short, rounded, margin reflexed, last dorsal semicircular.

Collected at Cape San Lucas, by Mr. John Xantus.

This species resembles *usta* and *brunnea*, but is paler in color and may be known by the structure of the antennæ. The two lateral rows of punctures end almost abruptly at middle.

C. usta, Lec.—Form moderately robust, color pale brown, surface sparsely pubescent. Head sparsely punctulate, eyes moderately prominent. Antennæ as long as half the body, joints two to three obconical, equal, together but little longer than the fourth, four to ten nearly equal, eleven somewhat longer. Thorax one-third longer than wide, base narrower than apex, feebly constricted in front of middle and rather strongly compressed at sides behind, no ante-scutellar impression, disc very sparsely and finely punctulate. Scutellum oval. Elytra twice as wide at base as thorax, humeri distinct, sides parallel, apex conjointly rounded, disc feebly convex, with striæ of moderate punctures becoming gradually smaller and extending to apical four-fifths where they become entirely obliterated, lateral striæ long; intervals broad, flat, with a single row of minute punctures. Body beneath and legs colored as above; metasternum very sparsely punctured at the sides, abdomen more densely punctulate. Length .38 inch; 9.5 mm.

Male.—Unknown.

Female.—Last ventral very short, broadly but very feebly emarginate, last dorsal slightly longer and semicircular. (Pl. I, fig. 4).

One specimen collected by Berlandiere, in southwestern Texas, resembles a small *brunnea*, but may be known by the antennal structure.

C. brunnea, Mels.—Dark brown, moderately shining, very sparsely pubescent. Head densely punctured, eyes feebly prominent. Antennæ very little longer than the head and thorax, joint two equal to fourth, third slightly longer, four to ten short, conical, nearly equal, eleventh longer than the two (♀) or four (♂) preceding together. Thorax robust, scarcely a fourth longer than wide and but little narrowed at base, very feebly constricted in front of middle, rather strongly compressed at sides posteriorly, no ante-scutellar impression, disc convex, very densely punctulate. Scutellum orbicular. Elytra nearly twice as wide at base as thorax, humeri distinct, sides parallel, apices conjointly rounded, disc moderately convex, with ten rows of coarse, quadrate, closely placed punctures extending from base to apex, intervals slightly broader than the striæ, feebly convex and with a row of very minute punctures. Body beneath and legs dark brown, abdomen paler, sides of metasternum coarsely and densely punctured, abdomen finely and sparsely punctured. Length .30—.56 inch; 7.5—14 mm.

Male.—Fifth ventral feebly arcuate, sixth short, trapezoidal, truncate at tip and narrower than the last dorsal which is elongate, gradually narrowed toward the tip, the latter rounded. (Pl. I, fig. 5).

Female.—Last ventral semicircular, last dorsal trapezoidal and feebly arcuate at tip.

The sexual differences in the antennæ have been given above, this being our only species in which such exist.

Occurs in Pennsylvania, Missouri, and Texas.

C. bicolor, (Say.)—Form elongate, body black, feebly shining, thorax (except apical and basal margins), basal half of femora and first two joints of antennæ reddish-yellow. Head black, sparsely punctured, labrum and palpi yellow, eyes prominent. Antennæ black except at base, longer than one-third the body, joint two very little shorter than the following, three to ten elongate, nearly equal, feebly subserrate, eleventh longer, paler at tip. Thorax one-half longer than wide, feebly constricted in front, moderately compressed at sides behind, median convexity at sides moderately strong, no ante-basal impression, disc very sparsely punctate, color reddish-yellow with a narrow basal and apical black margin. Scutellum transversely oval. Elytra twice as wide as thorax at base, humeri distinct, sides parallel, apices conjointly rounded, disc moderately convex, with striæ of moderate punctures becoming gradually feebler to apex· color black, epipleuræ paler. Body beneath piceous, very sparsely and finely punctured, abdomen with paler spots at the side of each segment. Legs black, base of femora yellow, tibiæ at tip piceous or somewhat paler. Length .30—.36 inch; 7.5—9 mm.

Male.—Fifth ventral arcuate at tip, sixth short, semicircular, feebly emarginate at tip, last dorsal longer and broader, longer than wide, broader at tip with angles broadly rounded and tip emarginate. (Pl. I, fig. 6).

Female.—Fifth ventral truncate, sixth semicircular and yellow, last dorsal oval at tip, longer than the last ventral, also yellow.

Occurs in the Middle and Gulf States, but is not common. May be easily known by its coloration.

The preceding and all the following species have the antennæ so nearly similar in their constituent parts, that no detailed description will be given in each, the following will answer for all: joint one stout, conical, slightly curved, two very little shorter than three, three to ten subequal, very gradually decreasing in length, eleventh longer and subacute.

C. inornata, (Say.)—Form slender, color piceous, moderately shining, sparsely pubescent. Head sparsely and finely punctate, eyes feebly prominent. Antennæ ferruginous, nearly half the length of the body. Thorax nearly cylindrical, feebly narrowed at base, sides before and behind the middle slightly compressed, surface sparsely punctate. Scutellum transversely oval, emarginate at tip. Elytra of form and sculpture of *bicolor*. Body beneath and legs brownish, coxæ and tarsi paler, abdomen very finely and sparsely punctate, each segment with a yellow spot at the sides. Length .30—.36 inch; 7.5—9 mm.

Male.—Fifth ventral arcuate, sixth short, semicircular and truncate at tip, last dorsal longer, angles obtuse, with an acute but feeble emargination at tip. (Pl. I, fig. 7).

Female.—Last ventral nearly semicircular, last dorsal longer and rounded at tip.

Occurs from Canada to Georgia, and Missouri.

C. fascifera, Lec.—Form slender, color pale piceous, elytra with median yellow fascia, surface sparsely pubescent. Head rather densely and coarsely punctured, eyes feebly convex. Antennæ ferruginous, not longer than head and thorax. Thorax one-third longer than wide, base slightly narrower than apex, very feebly constricted in front of middle, moderately compressed posteriorly, surface sparsely punctured and rugulose, a feeble ante-scutellar impression. Scutellum rounded, emarginate at tip and slightly concave. Elytra twice as long as thorax and nearly twice as wide at base, humeri distinct, sides nearly parallel, apices conjointly rounded, surface with striæ of moderate punctures extending beyond the middle, becoming very small and confused at apical fourth; color pale piceous, with median yellow band, arcuate posteriorly and dentate in front, humeri testaceous with the callus piceous. Body beneath and legs testaceous, sparsely and finely punctulate. Elytra paler than head and thorax. Length .32 inch; 8 mm.

Male.—Fifth ventral arcuate posteriorly, sixth semicircular, slightly impressed at tip, last dorsal longer, broadly rounded at tip, middle of apical margin prolonged. (Pl. I, fig. 8).

Female.—Unknown.

Greatly resembles *punctata*, and can scarcely be distinguished except by the sexual characters.

One ♂ from Cape San Lucas, Lower California.

C. californica, Horn.—Brownish piceous, moderately shining, sparsely pubescent, elytra with indistinct median pale fascia. Head moderately densely punctulate, eyes moderately prominent. Antennæ ferruginous, slightly longer than head and thorax. Thorax cylindrical, very feebly constricted in front of middle and slightly compressed behind, no ante-scutellar impression, disc not densely punctulate. Scutellum slightly transverse, longitudinally concave and smooth at middle, tip feebly emarginate. Elytra less wide than double the base of thorax, humeri distinct, sides slightly arcuate and slightly diverging posteriorly, tip rather strongly sinuate, sutural angle prolonged ♂, tip rounded ♀, disc slightly flattened and with striæ, in pairs, of small punctures which gradually become feebler toward the tip, intervals alternately broader and with one or two rows of finer punctures. Body beneath and legs ferruginous or brownish, very sparsely and finely punctured. Length, Male .76 inch; 19 mm. Female .84 inch; 21 mm.

Male.—Sixth ventral semicircular, truncate at tip and slightly emarginate, last dorsal longer, slightly broader at tip, the sides elevated in an obtuse carina with the angles reflexed, at middle an obtuse carina not attaining the apex, terminating abruptly. (Pl. I, fig. 9).

Female.—Sixth ventral semicircular, apex rounded. Last dorsal similar to male with the median carina prolonged in point at tip.

This species is the largest in our fauna, and may be known by the form of the tip of the elytra, and by the arrangement of the striæ in pairs.

Occurs in the lower Coast Range of California, and also in Arizona. (Cab. Ulke ♀).

C. morosa, Lec.—Piceous, form moderately slender, sparsely pubescent. Head moderately densely punctate, eyes moderately prominent. Antennæ nearly half the length of body, pale brown. Thorax one-third longer than wide, feebly constricted in front of middle, slightly compressed posteriorly, base slightly narrower than the apex with a feeble ante-scutellar impression, disc moderately densely punctate. Scutellum transverse, tip broadly emarginate. Elytra nearly twice as wide as base of thorax, humeri distinct, sides nearly parallel, apices conjointly rounded, disc with rows of moderately coarse punctures extending two-thirds to apex (the outer rows longer), and gradually becoming feebler, an indistinct transverse fascia very slightly in front of middle. Body beneath and legs brownish, very sparsely punctulate. Length .48 inch; 12 mm.

Male.—Fifth ventral very deeply emarginate, sixth elongate parallel, angles rounded prolonged in a point which is strongly incurved, the angles with a carina which extends two-thirds the length of the segment, tip broadly emarginate. Last dorsal elongate, narrower than the ventral, slightly narrowing to the tip which is triangularly notched, the angles being acute. Penultimate dorsal broadly emarginate. (Pl. I, fig. 10).

Female.—Unknown.

One specimen from Northern Sonora.

I do not find the specimen quite as long as the measurement originally given, (.53 inch). Resembles *inornata*, but less slender and easily known by sexual differences.

C. Belfragei, n. sp.—Very closely resembling *morosa* with the following differences: Thorax moderately punctured anteriorly, very feebly punctured at posterior three-fourths, ante-scutellar impression rather strong. Scutellum transversely oval. Striæ coarser and with more deeply impressed punctures, fascia slightly behind the middle and with irregular margins. Abdomen with rather coarse punctures sparsely placed. Length .48 inch; 12 mm.

Male.—Fifth ventral deeply emarginate, last ventral nearly square, slightly broader to tip which is deeply emarginate, angles prolonged, not incurved and with a carina extending two-thirds to base. Last dorsal elongate oval, acutely notched at tip, angles rounded. Penultimate dorsal emarginate. (Pl. I, fig. 11).

Female.—Fifth ventral feebly emarginate, sixth short, semicircular, notched at tip. Last dorsal narrower, slightly longer and acutely notched at tip.

This species differs from *morosa* in the sexual characters of the male, and the more feeble characters of sculpture as noted above.

Collected by Mr. G. W. Belfrage, in Waco County, Texas.

The three species which follow do not admit of their characters being tabulated in a positive manner. The following may serve for the two sexes, the males being easily known by their peculiar characters.

Elytral sculpture almost entirely obliterated, traces of the rows of punctures remaining only at base. Thorax moderately long, distinctly broader in front, not coarsely punctate..**oblita.**

Elytra with the usual distinct rows of punctures.

  Thorax nearly cylindrical, coarsely and densely punctured. Striæ of elytra with deep punctures, extending to three-fourths........................**punctata.**

  Thorax more robust, considerably broader in front, rather sparsely punctured. Striæ of elytra with feeble punctures extending barely to middle. **fuscula.**

C. oblita, n. sp.—Pale brownish, moderately shining, sparsely pubescent, form elongate. Head darker, moderately densely punctured, eyes feebly prominent. Antennæ ferruginous, nearly half the length of body. Thorax nearly a third longer than wide, base slightly narrowed, slightly constricted in front of middle, and rather strongly compressed posteriorly, ante-scutellar impression well marked, surface very sparsely punctulate. Scutellum broader than long, slightly emarginate at tip. Elytra twice as wide as base of thorax, humeri distinct, sides parallel, tip conjointly rounded, disc sparsely and irregularly punctate, the striæ evident for a very short extent at base, a median indistinct transverse fascia. Body beneath very sparsely punctate. Length .44 inch; 11 mm.

Male.—Fifth ventral very deeply emarginate, sixth longer than wide, sides straight and gradually narrowing to apex, angles slightly prolonged, acute, between which the tip is rounded. Penultimate dorsal emarginate, last dorsal elongate oval, narrower than the ventral, tip feebly emarginate. The angles of the last ventral segment are carinate, the lower face especially at base obtusely elevated at middle. (Pl. I, fig. 12).

Female.—Unknown.

One specimen from Camp Grant, Arizona.

The elytral sculpture may possibly be a peculiarity of the unique before me, but in any case the male characters suffice to distinguish the species from any other.

C. punctata, Lec.—Pale brownish testaceous, form slender, sparsely pubescent, legs with rather long hairs. Head rather coarsely and densely punctate, eyes moderately prominent. Antennæ ferruginous, longer than one-third the body. Thorax nearly twice as long as wide, cylindrical, slightly constricted in front of middle and feebly compressed behind it, no ante-scutellar impression, disc coarsely and densely punctate. Scutellum oval, narrower at base. Elytra less than twice the width of thorax at base, humeri distinct, sides slightly divergent posteriorly, apices conjointly rounded, disc with striæ of moderately coarse punctures extending three-fourths to apex, becoming gradually finer and confused at tip, and with a pale fascia behind the middle, extending along the margin toward the apex. Body beneath paler than above, sides of metasternum with coarse but sparse punctures, abdomen still paler, sparsely punctulate. Length .30 inch; 7.5 mm.

Male.—Fifth ventral deeply emarginate, sixth oval, longer than wide, feebly emarginate at tip; last dorsal oval, longer than wide and truncate at tip. (Pl. I, fig. 13). *Female.*—Unknown.

Occurs near Fort Yuma, California.

C. fuscula, Lec.—Brownish testaceous, form less slender, sparsely pubescent. Head moderately densely, but not coarsely punctured, eyes moderately prominent. Antennæ as long as half the body, ferruginous. Thorax scarcely a fifth longer than wide, base much narrower than apex, feebly constricted in front of middle, rather strongly compressed posteriorly, ante-scutellar impression distinct, disc sparsely and finely punctate. Scutellum subquadrate, truncate at tip. Elytra twice as wide as base of thorax, humeri distinct, sides nearly parallel, apices conjointly rounded, disc with striæ of feeble punctures extending barely to middle, the outer striæ longer, apical third of elytra finely punctulate; an irregular testaceous fascia at middle sometimes becoming a mere spot on each elytron. Body beneath and legs very sparingly punctulate, paler in color than above. Length .22—.28 inch; 5.5—7 mm.

Male.—Fifth ventral deeply emarginate, sixth oval, broadly but feebly emarginate at tip, last dorsal narrower than the ventral, sides nearly straight and convergent, tip very feebly emarginate. (Pl. I, fig. 14).

Female.—Last ventral oval at tip.

This species occurs at Fort Yuma, and also in Arizona, where I found specimens about the exuded gum of the Mesquite tree.

C. undulata, Say.—Form slender, color brownish, legs and abdomen pale testaceous, elytra with three transverse dentate testaceous fasciæ Head brown, densely punctured, eyes feebly prominent. Antennæ nearly half the length of the body, ferruginous. Thorax one-half longer than wide, densely punctured, base narrower than apex, in front of middle moderately constricted, posteriorly rather strongly compressed, ante-scutellar impression well marked. Scutellum transversely oval. Elytra nearly twice as wide as base of thorax, humeri distinct, sides gradually divergent, apices conjointly rounded, disc with striæ of coarse punctures which gradually become finer and extend four-fifths to apex. Body beneath brown, abdomen and legs testaceous, very sparsely punctate. Length .42 inch; 10.5 mm.

Male.—Fifth ventral deeply emarginate, sixth trapezoidal, longer than wide, emarginate at tip with the angles obtusely prominent. Last dorsal elongate, oval, narrower than the ventral, truncate at tip. (Pl. I, fig. 15).

Female.—Last ventral nearly semicircular, subtruncate at tip, last dorsal similar in shape but longer.

I have united *balteata*, Lec., with this species, although the thorax is less decidedly constricted before and behind the middle. The type is a female and gives no character different from the female of *undulata*. The discovery of the male may, however, cause it to be separated, as we have already seen that the most trifling superficial characters indicate a difference of species, better defined by sexual peculiarities.

Occurs from the Middle States to Kansas and Texas.

C. angustata, Spin.—Pale brown, form rather slender, body apterous, surface sparsely pubescent, elytra with three indistinct, paler transverse fasciæ. Head rather coarsely and densely punctured, eyes feebly prominent. Antennæ ferruginous, nearly half the length of body. Thorax one-third longer than wide, very feebly constricted in front of and behind the middle, base somewhat narrower than apex with distinct ante-scutellar impression and a tubercle on each side, surface densely and coarsely punctured. Scutellum transversely oval. Elytra very little wider at base than the thorax, humeri feeble, sides feebly arcuate and slightly diverging to apex, tips separately rounded, disc with rows of coarse punctures which gradually become more distant and somewhat smaller to apical fourth. Body beneath and legs paler, sparsely punctate. Length .30—.44 inch; 7.5—11 mm.

Male.—Fifth ventral deeply emarginate, sixth elongate, sides nearly parallel with the tip, deeply emarginate, the angles prolonged, obtuse. Last dorsal obovai, tip with a small acute notch limited on each side by a small acute tooth; penultimate dorsal broadly triangularly emarginate. (Pl. I, fig. 16).

Female.—Fifth ventral feebly emarginate, sixth broadly oval at tip. Last dorsal more elongate oval.

Occurs at Fort Yuma and elsewhere in the south of California. It is more coarsely punctured than *ovipennis*, with less oval elytra and different male characters.

C. ovipennis, Lec.—Pale brown, elytra with indistinct median pale fascia. Head densely punctured, eyes moderately prominent. Antennæ ferruginous, nearly half the length of body. Thorax one-half longer than wide, rather strongly constricted in front of middle and strongly compressed posteriorly, ante-scutellar impression rather strong with a tubercle on each side, surface sparsely punctured. Scutellum oval. Elytra scarcely wider at base than the thorax, sides moderately arcuate and divergent posteriorly, apices conjointly rounded, disc with striæ of coarse punctures extending to middle, the outer striæ longer. Body beneath paler, very sparsely punctate. Length .34—.44 inch; 8.5—11 mm.

Male.—Fifth ventral moderately emarginate, sixth very deeply emarginate with the angles prolonged; penultimate dorsal feebly emarginate, last dorsal longer than wide, truncate at tip with a long acute notch. (Pl. I, fig. 17).

Female.—Last ventral semicircular, last dorsal subtruncate at tip.

The males of this species show a very feeble truncation of the tips of the elytra, which might readily escape notice.

Occurs at Fort Tejon, California, and is not rare. The elytra are more decidedly oval than in *angustata*, and the male characters sufficiently different.

C. pilosella, Lec., is founded on two small females, which agree in all the important characters with *ovipennis*, the above description applying equally to this except as to size, (.26 inch). I do not feel warranted in continuing it as a distinct species, but the discovery of a corresponding male may lead to different results.

C. tenera, Lec.

This species has caused me much trouble, the type and only specimen known is in a bad state and very immature. It agrees in form, size, and sculpture, with *inornata*, and the description will answer equally well for this, except that there is a circum-humeral pale space and irregular median fascia. I have never seen specimens of *inornata* showing any trace of fasciæ, although such traces do exist in the black elytra of *bicolor*, and did this unique resemble the normal *bicolor* as closely as it does *inornata*, I would have no hesitation in uniting them in view of the traces of fasciæ which exist. I must, however, strongly incline to the view of its identity with *inornata*, and leave the matter to future collectors.

There are two other specimens, both females, from Texas, which indicate distinct species, not knowing the males I must decline to name them, but will give short descriptions.

C. ———, .—Form and sculpture of *undulata*, legs brown, elytra with post-humeral pale lunule, a median sinuous band, and apex pale. Body beneath dark brown. Length .40 inch; 10 mm.

C. ———, .—Form and sculpture of *fuscula*, elytra with median pale fascia and a common subapical spot, divided by the suture. Length .30 inch; 7.5 mm.

These two species should be placed near those with which I have compared them.

BIBLIOGRAPHY.

C. longicornis, Lec., Synopsis Cleridæ, Ann. Lyc. V., p. 17.
C. puncticollis, Bland, Proc. Ent. Soc., Philada., I., p. 356.
C. Xanti, n. sp.
C. usta, Lec., Proc. Acad., 1858, p. 71.
C. brunnea, Mels., Proc. Acad. II., p. 306; Lec., Ann. Lyc. V., p. 15.
  cancellata, Lec., Proc. Acad., 1854, p. 81.
C. bicolor, Say., (*Tillus*), Journ. Acad. V., p. 174; Lec., Ann. Lyc. V., p. 16.
C. inornata, Say, (*Priocera*), Bost. Journ. I., p. 161; Klug., Abhandl. Berl. Acad., 1842, p. 271.
  tenera, Lec., Ann. Lyc. V., p. 15.
C. fascifera, Lec., New Species, p. 95, (Smithsonian Contributions), 1866.
C. californica, Horn, Trans. Am. Ent. Soc., 1868, p. 134.
C. Belfragei, n. sp.
C. morosa, Lec., Proc. Acad., 1858, p. 71.
C. punctata, Lec., Ann. Lyc. V., p. 212.
C. fuscula, Lec. Ann. Lyc. V., p. 212.
C. oblita, n. sp.
C. undulata, Say., (*Tillus*), Journ. Acad. V., p. 174; Lec., Ann. Lyc. V., p. 15.
  longicollis, Spin., Mon. Cler. I., p. 147, pl. 10, fig. 1.
  Bosci, Chevr., Ann. Ent. Soc. Fr., 1843, p. 31.
  var. *balteata*, Lec., Proc. Acad., 1854, p. 81.

C. angustata, Spin., Mon. Cler. I., p. 149, pl. 7, fig. 1.
C. ovipennis, Lec., Proc. Acad., 1859, p. 76.
  var. *pilosella*, Lec., New Species, p. 95.

Note.—In the Catalogus, (Gemminger and Harold), p. 1726, a *C. cratægi*, Bland appears, with a reference. No such species was ever published.

TRICHODES, Hbst.

Our species are so few in number and so easily distinguishable as hardly to need comment. The occurrence of a singular species from Arizona, gives the opportunity for a few remarks which may be put in the form of a table.

Elytra with tip truncate and sinuate in ♀..**illustris.**
Elytra rounded at tip in both sexes.
  Elytra bluish, variegated with yellow or reddish bands, rather finely scabropunctate. Thorax very sparsely punctured.
    Elytra with three yellow bands, the basal enclosing a humeral blue spot, extending backward along the suture; a median oblique band; a subapical band, oblique from behind anteriorly to suture. Tibiæ usually pale..**ornatus.**
    Elytra with three transverse bands of red or yellow, basal, median and sub-apical. Legs entirely blue..**Nuttalli.**
    Elytra with red spot on the side of each elytron near the middle, sometimes entirely wanting..**bisignatus.**
  Elytra red or orange, with transverse bands of violet black, surface with very coarse and deep punctures. Thorax densely punctured.
    Elytra with two transverse bands and tip black......................**apivorus.**
    Elytra with two broad transverse bands...............................**bibalteatus.**

The sexual characters are very much alike in all the species, and may be seen on pl. I, fig. 28.

T. illustris, n. sp.—Form elongate, parallel, body metallic blue, elytra variegated, legs ferruginous. Head blue, densely punctured, sparsely pubescent; antennæ pale. Thorax oval, longer than wide, constricted at base, surface densely punctured and sparsely pubescent, with smooth median line posteriorly. Elytra parallel, conjointly rounded ♂, truncate and sinuate at tip ♀, disc with rows of very coarse punctures becoming smaller at sides, and smaller and confused behind the middle; color brownish ferruginous, with a basal yellow band prolonged along the suture, but not dilated, a band at middle slightly oblique, another at three-fourths, extending obliquely forward from the margin to the suture, yellow bands bordered with black, which also extends along the margin except at tip. Body beneath densely punctured, metasternum densely clothed with whitish hairs on each side of middle, abdominal segments with whitish hairs on the posterior margin at the side. Length .54 inch; 13.5 mm.

This species is entirely unlike any of our others, although allied by its markings to *ornatus*. There is, however, no humeral dark spot; the umbone is prominent and less punctured. The sexual ventral characters are as in the other Trichodes.

The two specimens before me, (the ♂ was kindly loaned by Mr. Ulke), were obtained by Mr. Otto Luggar, (of Baltimore), from Arizona.

In the above wood cut the white portions are yellow, the lined spaces ferruginous, and on the margins of the yellow are the black borders. The male in the cabinet of Mr. Ulke, is smaller and the dark colors are lighter, so that, what is described as black in the female is brown, and the brown is dirty ochreous.

The sexual characters of North American CICINDELIDÆ with notes on some groups of CICINDELA.

BY GEORGE H. HORN, M. D.

The present paper is the first of a series which I hope to continue from time to time, in which the sexual characters of each genus in our fauna will be fully exposed, and noticing at the same time any special characters whether sexual or not, likely to prove useful to the systematist.

I am not aware that any similar work has ever been attempted, while its great utility must be acknowledged by all. In most of the larger works on the genera of Coleoptera, mention is made of the more prominent sexual characters, while others less obvious but often more useful are entirely omitted, and it is to these that I desire to devote special study.

It is often annoying in studying a generic synopsis to find groups indicated in which the males do or do not possess a given character, and this is frequently the only sexual character spoken of at all, its absence being peculiar to all the females and a portion of the males, and there is no additional character given which will absolutely distinguish all males from the females.

It is my desire to bring together in one paper all the sexual characters heretofore known, and to add whatever new it may be my good fortune to discover. Some characters may be overlooked, but with the present as a basis, others may be added as each investigator may find them.

CICINDELIDÆ.

The sexual characters of this family as a whole may be stated to be as follows:

Anterior tarsi dilated and last ventral segment deeply emarginate in the males.

Amblychila is an exception to the above, having special characters in the hind trochanter ♂.

The MANTICORINI in both sexes have the middle tibiæ pubescent on the outer side, the MEGACEPHALINI and CICINDELINI the males alone have the middle tibiæ pubescent, while in two species of *Cicindela* (*Dromochorus*), *Pilatei* and *maga*, the middle tibiæ are glabrous in both sexes.

With these preliminary remarks, the reader is referred to the special characters of the genera and species.

AMBLYCHILA, Say.

Male.—Hind trochanter elongate, oval and acute at tip, with one moderately deep groove on the inner side and a trace of a second. Last ventral segment broadly rounded at tip, and with a vague marginal groove and large setigerous punctures on each side of middle.

Female.—Hind trochanter oval, very obtuse at tip, not grooved. Last ventral segment slightly longer than that of the male, middle slightly prominent with a sinuation on each side, and with a feeble median longitudinal impression.

To Mr. H. A. Brous, of Kansas, we are indebted for all that we at present know of the habits of *Amblychila*. Having had the pleasure of a visit from him, he has kindly furnished the following notes:

> This insect is nocturnal or crepuscular, rarely appearing before sunset or after sunrise, except on cloudy and rather warm days. During periods of rain or cold it remains concealed. Its hiding places are holes usually excavated by itself in clay banks where there is but little wash, otherwise the holes would be filled up. They are solitary in their habits although several may live in close proximity, but never in the same burrow, and from the fact that they are often found mutilated it is probable that pugnacity is a highly developed trait. In moving about they have a swaggering gait, with the antennæ in constant motion.
>
> They are like all the Cicindelidæ, predaceous, locusts and other insects falling an easy prey at night, although they have been observed feeding on excrementitious matter.
>
> From what has been observed, and from the remains found, it is probable that *Amblychila* is by no means rare, but its peculiar habits and mode of life have caused it to be overlooked by all the collectors who have visited the plains.

Its habitat is Kansas and Colorado, south of the Platte River, southwestern Arkansas, Indian Territory, probably northern Texas, New Mexico and eastern Arizona.

OMUS, Esch.

Male.—Three joints of anterior tarsi dilated, (the dilatation not bilateral, but more internal than external), and densely spongy pubescent beneath. Last ventral segment deeply emarginate at middle.

Female.—Last ventral segment oval at tip and entire, and with a marginal groove composed of large deeply impressed punctures, each bearing a short seta.

TETRACHA, Hope.

Male.—Anterior tarsi dilated as in Omus. Last ventral segment broadly triangularly emarginate. Tip of elytra sub-truncate, sutural angle rectangular.

Female.—Last ventral segment broadly oval at tip. Tip of each elytron rounded, sutural angle obliterated.

CICINDELA, Linn.

General sexual characters.

Male.—Three joints of anterior tarsi dilated, with short silken pubescence beneath. Last ventral segment broadly emarginate. Middle tibiæ pubescent on the outer side.

Female.—Anterior tarsi slender. Last ventral segment longer than in the male, slightly compressed at the sides, posterior half with a longitudinal impression varying in depth according to the species. Middle tibiæ glabrous.

The emargination of the sixth ventral segment of the male allows the seventh segment to become very plainly visible, divided into two symmetrical portions, the left overlapping the right, the whole constituting by this modification part of the genital armature.

A careful examination of the females of certain species convinces me that the last ventral segment is composed of parts which represent the sixth and seventh segments of the male. That portion which corresponds with the sixth of the male may be seen distinctly defined by an obsolete suture in those species in which the abdomen is rufo-testaceous, (*marginipennis*, etc.), and the seventh segment of the male is that portion of the female sixth in which the longitudinal impression is included, the bottom of the impression representing the joint of the halves of the male segment.

In addition to the sexual characters above given, and which are common to all the species of the genus, there are others found in various portions of the body peculiar to and at times definitive of groups. These occur in first, the mandibles; second, the labrum; third, the thorax; fourth, the elytra; and may be again tabulated in the following manner.

MANDIBLES.—Normal form: Similar in the sexes and both sides equal. Abnormal form: Right mandible of male furnished with a tooth, of greater or less length, on the lower margin near the tip, (*dorsalis*, *marginata* and *hamata*).

LABRUM.—This organ may vary in length in the sexes, that of the female being longer, (*unipunctata*, *longilabris*), or in color, white in the male and black in the female, (*longilabris*, var. *montana*, *Pilatei*, *striga*). In some species (*scutellaris* and its races), the labrum varies in color regardless of sex. The teeth of the labrum are sometimes more marked in the female, as in *striga*.

THORAX.—The normal form may be either trapezoidal, narrower at base, or very nearly cylindrical, and in each case similar in the sexes. In many species the hind angles become prominent, and the base broader than the apex or as broad, and the transverse basal impression deeper, (*hirticollis*, *dorsalis*, *hamata* and *marginata*). These are all maritime species.

ELYTRA.—In nearly all the species the usually more robust form of the female enables that sex to be distinguished at a glance, the form is, however, identical in the sexes. The differences worthy of comment are, those (1), of general form, (2), the sub-apical sinuation, or (3), the tip and sutural angle. While the males have the normal form, the females have the elytra much more broadly arcuate at the sides in all the maritime species above noted, and rather strongly subangulate behind the humeral angle in *dorsalis*. These species furnish the only examples of marked difference in outline. The elytra narrow at tip, by being gradually arcuate or oblique, and while these typical styles merge insensibly, the latter form is gradually modified by becoming more and more sinuate, especially in the females, until a well marked tooth appears varying in the degree of its acuteness. This is especially marked in certain of our fluviatile species in which the elytra have the additional basal spot, (*cuprascens*, *macra*, *puritana*, etc.) The tip adjacent to the suture may be in the form of an acute angle, rectangular, truncate or rounded. In most of the species the form does not vary sexually, but may be any one of the above forms in either sex, and when a sexual variation does occur, the male makes the nearest approach to the acute angle, *e. g.*

dorsalis, ♂ subtruncate, ♀ rounded.
marginata, ♂ subtruncate, ♀ rounded, suture retracted.
cuprascens, ♂ acute, ♀ rounded.
puritana, ♂ acute, ♀ truncate.
macra, ♂ acute, ♀ sinuate and acute.
Gabbii, ♂ obtuse, ♀ broadly rounded.

These examples are sufficient to show the amount of sexual variation of this character. *C. marginata*, ♀, is remarkable for having the tip retracted in such a manner that a portion of the sutural region is vertical. The suture in many species bears a spine of greater or less length, common to both sexes and usually longer in the female.

The serration of the apical regions has been noted at times, this however, varies so greatly in both sexes that nothing general can be said.

Dromochorus, Guerin.—I must acknowledge that I entirely agree with Dr. Leconte in the suppression of this genus. There is no character of sufficient moment for its separation, the only one known to me which can be used is found in the middle tibia of the male. This member is glabrous on the outer edge, like the female and entirely lacks the pubescence so characteristic of the other species of Cicindela as far as known to me. In *Amblychila* and *Omus* both sexes have similarly pubescent middle tibiæ. *Tetracha* and *Cicindela* agree in having the males pubescent only, while *Dromochorus* is not pubescent in either sex. In every other sexual character *Dromochorus* does not differ from *Cicindela.*

Group *dorsalis.*

The form of the thorax of the female is the special character of this group. The thorax is broader at base and the hind angles obtusely prominent, and between them is a deep basal impression.

The claws are long and slender, as long or longer than the last joint of tarsus. Posterior trochanters metallic in color. The posterior angles of the third and fourth abdominal segments are very feebly prolonged. The last two joints of the maxillary palpi equal.

The three forms constituting this group seem to me to be merely varieties of one species. The right mandible of the male bears on its lower side near the tip a tooth, long and acute in *dorsalis*, shorter and less acute in *media*, and still less prominent in *Saulcyi*. There are no other characters excepting size, the last mentioned form being the smallest, and as we find all grades of size in body and mandible tooth, I prefer uniting them.

This species is distributed along the Atlantic and Gulf coasts from the Middle States to Texas, and becomes smaller as it approaches the latter locality.

Group *marginata*.

This group contains two maritime species, and has the following characteristics.

Thorax scarcely differing in the sexes, elytra differing in shape. Right mandible ♂, toothed beneath. Last joint of maxillary palpi slightly longer than the preceding. Hind trochanters red. Claws long and slender. Third and fourth segments of abdomen moderately prolonged.

Elytra with median basal spot, humeral lunule oblique but straight, hooked at tip.

The presence of the mandibular tooth in the male, and the retraction of the suture of the female, seem to me worthy of use as group characters.

The two species differ, especially as indicated by pl. I, fig. 19, (*hamata*), and 20, (*marginata*).

C. hamata, Brullé.

Male.—Feeble mandibular tooth. Elytral apex rounded.

Female.—Suture retracted, and with an emargination and a spiniform prolongation of the inflexed portion.

C. marginata, Fab.

Male.—Moderate mandibular tooth. Apex of elytra with slight sinuation near the suture, which is acutely but feebly prolonged.

Female.—Suture retracted, and with a slight emargination and the inflexed portion squarely truncate.

Group *cuprascens*.

The only defining character of this group is the presence of a sinuation, and often a tooth on the female elytron one-fourth from the tip.

The elytra in the two sexes do not vary to any marked extent in form. The mandibles are not toothed in the male. The thorax is similar in the sexes, very slightly more impressed in the female, the trochanters red, claws long and slender, and with abdominal segments feebly prolonged.

This group is capable of subdivision in the following manner:

1.—Abdomen glabrous at middle and with very few punctures.
  Elytra with basal white spot.
    Females with a distinct sinuation limited by an evident angulation or tooth. Elytral markings rather slender, not confused.................. **A.**
    Females with a feeble sinuation only. Elytral markings broad and confused.................. **B.**
  Elytra without basal spot.
    A strong sinuation in the female with moderate tooth, markings slender.. **C.**
2.—Abdomen pubescent at middle and finely and rather densely punctured.
    A small basal spot joined to the humeral lunule, markings broad and confused.................. **D.**

The species of section A of this group contains five species, one of which however, may be viewed with some doubt, (*Magdalenæ*). The following remarks with the figures already published, will assist in identifying them.

Humeral lunule oblique, suddenly hooked at tip.
  Median band sinuous and long.......... **cuprascens, macra, puritana.**
  Median band short, terminated by a short hook.................. **Wapleri.**
Humeral lunule curved as in *repanda*.
  Median band moderately long, not sinuous at tip; a sutural stripe near the base.................. **Magdalenæ.**

The first three species have always proven very troublesome to all students. They have similar elytral markings, broader in *cuprascens*.

	cuprascens.	**puritana.**	**macra.**
Color.......	—Cupreous. Elytra coarsely and rather densely punctured.	Bronzed. Elytra more finely and less densely punctured.	Bronzed. Elytra finely and sparsely punctured.
Elytra ♀.	—Strongly sinuate near the tip, tooth acute and prominent. Tip rounded. Pl. I, fig. 21.	Strongly sinuate, tooth rectangular. Tip obtusely truncate. Fig. 22.	Less sinuate, tooth rather obtuse. Tip slightly prolonged, suture spinous. Fig. 23.
Elytra ♂.	—Tip obtuse.	Tip subacute.	Tip slightly prolonged.

An additional character of less value is seen in the median band, which bears at its tip in *cuprascens* and *macra* a broad, triangular spot, while in *puritana* the tip is scarcely at all dilated except in very rare instances. The elytra of *cuprascens* and *macra* have been figured. (Synopsis, Leconte, Trans. Am. Phil. Soc., XI, pl. I).

C. Wapleri, Lec., Trans. Am. Ent. Soc., 1875, p. 158.

The female is unknown, but the species belongs here rather than with *blanda*. The figure gives the markings very accurately.

C. Magdalenae, Lec., Proc. Acad., 1873, p. 321; Trans. Am. Ent. Soc., 1875, p. 159, with figure.

I had very little opportunity to do anything with this species, except prepare a sketch from which the wood cut above cited was made. It is even doubtful if the species belongs to our fauna. The type is in the museum of Magdalen College, Oxford, England.

One species (*blanda*), constitutes section B. It has very broad elytral markings, very badly defined in the two specimens I have seen. The humeral lunule unites with the basal spot, the median band is sinuous as in *cuprascens*, or even more so. The female has no tooth near the tip of the elytron, and the sinuation is very feeble. (Fig. 24). This species is a lead in the direction of the *Gabbii* group.

Section C contains two species which differ from all the others in the group, in the absence of the basal spot, and by the markings being usually disconnected along the margin.

C. sperata, Lec.—Dark bronze; labrum with median tooth; median band with long, moderately sinuous longitudinal portion; anterior end of apical lunule moderately prolonged.

Male.—Elytra slightly sinuous near the tip, the latter acute with sutural spine.

Female.—Elytra rather strongly sinuous, and with a distinct angulation. Tip less prolonged than in male but with sutural spine.

C. nevadica, Lec.—Coppery bronze, labrum without median tooth. Elytral markings widely disconnected along the margin. Median band with rather short, feebly sinuous longitudinal portion. Apical lunule not prolonged in front.

Male.—Elytra broadly subsinuate near the tip.

Female.—Elytra strongly sinuous, the anterior angle of the sinuation rounded.

For fuller description and figure, see (Trans. Am. Ent. Soc., 1875, p. 159).

Section D contains two species especially characterized by the entire abdomen being punctured, and covered at middle with similar pubescence as at the sides.

C. hirtilabris, Lec.—Labrum rather densely clothed with prostrate hairs. The markings are similar to those of *gratiosa*, but less extended, so that the sutural dark space is broader.

Male—Elytra very feebly sinuate, tip obtuse.

Female.—Sinuation deeper, limited in front by a distinct angulation, tip obliquely truncate. (Fig. 25).

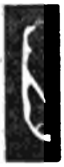
By some accident the measurement given (Trans. Am. Ent Soc., 1875, p. 161), is incorrect, it should be .38 inch, not .62 as printed.

C. gratiosa, Guerin.

The description and figure in the synopsis suffice to distinguish this species.

The group *cuprascens,* through its members exhibits affinities in many directions. The group as a whole, naturally follows the *dorsalis* and *marginata* groups; *Magdalenæ* seems to me to point toward *lepida*, *sperata* toward *Gabbii,* and *gratiosa* toward *togata* and its allies.

The presence of the sutural vitta is of rare occurrence in our fauna, being present only in *Magdalenæ* and *lepida.* In these two species it exists as an independent marking, and is in no way similar to the dilated humeral lunule of *dorsalis.*



C. Schauppii, n. sp.—Head and thorax dark bronze, sparsely hairy. Elytra velvety black. Body beneath metallic blue, sides of metasternum brilliantly cupreous, entire abdomen and posterior trochanters red. Labrum white, slightly longer in ♀, truncate at middle and slightly sinuate each side. Eyes moderately prominent, head slightly strigose near the eyes. Thorax slightly narrowed behind, impressions distinct. Elytra with velvety surface, smaller punctures obsolete, a row of larger greenish punctures near the suture and others near the humerus; margin narrowly white, slightly dilated at the humerus and again behind it, median band reduced to a straight, oblique line, apical lunule slightly prolonged in front. Legs bluish green, femora cupreous beneath. Length .42 inch; 10.5 mm.

The elytra at tip are conjointly rounded, very finely serrulate, and the suture slightly spinous.

This species belongs near *circumpicta* and *prætextata*, and resembles the latter considerably in its markings, but differs in its entirely red abdomen, It also differs from nearly every other red-abdomen species in the entire absence of any labrum tooth.

Two specimens, Corsicana, eastern Texas.

It gives me great pleasure to dedicate this species to Mr. F. G. Schaupp, of Brooklyn, and at the same time acknowledge my indebtedness for this and many other very interesting additions to my cabinet.

Notes on some COLEOPTEROUS REMAINS from the bone cave at Port Kennedy, Penna.

BY GEORGE H. HORN, M. D.

In company with Prof. E. D. Cope, I visited Mr. C. M. Wheatley, and made an examination of some masses of clay from which were obtained many fragments of Coleoptera. These remains were of the least destructible portions, and for the most part consisted of the original chitinous material more or less altered, yet retaining in several instances the surface sculpture.

Shortly after my visit I gave to Mr. Wheatley a list of the species as I had at that time determined them. Subsequent studies have caused me to reduce the number and at the same time recall certain names which I then gave. The reasons for this course will be given further on.

From the determinations of Messrs. Cope and Wheatley, the mammalian remains belong to the Post-Pliocene period, and geologically speaking not far removed in the past, and in fact very strongly connected with the present geological period, several of the vertebrates being identical with those now living and others very closely allied.

Studies of the distribution of our Coleoptera have led to some very curious results, which I think will bear out the supposition that many existing species have come down to us from preceding geological periods. Two species of *Cicindela* illustrate this supposition, one of them having been already fully dwelt upon by Dr. Leconte, in his address before the American Association for the Advancement of Science, Detroit, 1875. The other species is *hæmorrhagica* which occurs on the sea coast of southwestern California, extending thence in a northeasterly direction to Owen's Valley, and following the extension of the Mojave desert reaches Nevada, and finally the head waters of the Yellowstone, varying somewhat in trifling characters in their extent of distribution. This also is the border line of the Cretaceous gulf which gradually disappeared by the rise of the land and the formation of fresh water lakes, until these in turn gave place to the dry land now existing. It may be inferred that these species, as well as others which might be mentioned, are the direct descendents probably, very little changed, of those existing during the period named.

If these deductions be correct, the inference is, that great care should be exercised in the description, or at least the naming, of Coleopterous remains. We can never expect to have more than an elytron or thorax, and it seems to me folly to give these names because they are ancient, when no one would pretend (except in rare instances), to do the same with fragments of existing species.

At the risk of some criticism from palæontological students, I prefer to follow a conservative course, and in the following pages have given names to those species which seem really to differ from those of our present fauna, and for the others have merely indicated the genera to which they seem to belong.

CYCHRUS.

C. Wheatleyi.

Of this species I have before me a flattened thorax, all the actual substance of the upper surface being present in moderately good preservation, and the large portion of a left elytron of which but a small portion of the substance remains.

The thorax although flattened bears evidence of having the disc moderately convex, the median line distinct, the transverse basal impression rather deep and the lateral margins broad, wider at base and reflexed. The hind angles are obtuse and not prolonged, the base being moderately emarginate. The sides are moderately arcuate and gradually narrowed toward the base, the widest portion of the thorax being slightly in front of the middle. A species is thus indicated resembling *viduus* but smaller, not exceeding in size the average specimens of *Andrewsii*.

The elytra are finely striate, the intervals moderately convex and apparently smooth, the striæ with moderate punctures not as closely placed as in any species on this side of the continent. The striæ are as numerous as in *viduus* or *Andrewsii*.

Thorax.—Width .24 inch; 6 mm. Length .16 inch; 4 mm.

Elytra (restored).—Width .48 inch; 12 mm. Length .66 inch; 16.5 mm.

I think there is very little doubt of the distinctness of this species from any at present existing, but it may be inferred that it is the species to which our *viduus* must look for its ancestry.

I have named the species in honor of Mr. Charles M. Wheatley, of Phœnixville, to whom we are indebted for the exploration of the locality in which the fossil insects were discovered.

C. (minor).

Two fragmentary elytra of smaller size than the preceding, afford the only groundwork for the name above suggested. The striæ are fine and with fine punctures, the intervals feebly convex, evidently slightly rugulose, and probably, also sparsely punctulate. An impression of the scutellum remains which is broadly triangular, and not different in form from that of *Andrewsii.*

Elytra (restored).—Length .54 inch; 13.5 mm. Width (actual) .15 inch; 3.75 mm.

The form is therefore, almost exactly that of *Andrewsii.*

PTEROSTICHUS.

P. sp.

Fragments of two elytra. Elytra striate, striæ impunctured, intervals moderately convex, smooth.

A species apparently of the size of *coracinus* or *stygicus* is indicated, but without more material it seems unnecessary to name it, or guess as to its affinities.

P.? sp.

The greater portion of two elytra with the basal and apical ends wanting, indicate a form of larger size than any of our eastern species of *Pterostichus.* The elytral substance is in extremely bad state, being wrinkled and cracked in such a manner as to render a description of its surface impossible. It may be a *Lophoglossus.*

CYMINDIS.

C. aurora.

Elytra. Striæ moderately deep, indistinctly punctured, intervals irregularly, biseriately punctulate, and very finely alutaceous. Length .30 inch; 7.5 mm.

The greater portion of both elytra remain, somewhat distorted by pressure and retaining much of the chitinous substance. A species is indicated closely related to *C. americana*, but somewhat larger. The punctuation of the intervals and the arrangement of the striæ near the tip, resemble so closely those of *Cymindis*, that I place the species in that genus.

CHLÆNIUS.

C. punctulatus.

One elytron of the size and very similar to that of *C. laticollis*, from which it differs in having the striæ more finely impressed and the punctures rather closer, while those of the intervals are coarser and less numerous. Length .40 inch ; 10 mm.

There can be no doubt that the generic determination is correct in this instance.

DICÆLUS.

D. alutaceus.

Two elytra much flattened, retaining their proper position in relation to each other, remain, with but little of their actual substance, enough however to indicate the surface sculpture.

A species is indicated bearing a close relationship to *dilatatus*, but with the intervals somewhat more convex and the surface more distinctly alutaceous. The humeral carina appears to have been extremely fine and rather less elevated than in *dilatatus*.

Elytra.—Length .70 inch ; 17.5 mm. Width .40 inch ; 10 mm.

The measurement includes also the portion of the elytra covered by the base of the thorax. With proper allowance being made for flattening a species is indicated of as large size as our largest *purpuratus* but relatively narrower.

D. sp.

Another species of much smaller size than the preceding, is indicated by an impression of the greater part of both elytra and a very small fragment of one elytron, resembling *D. elongatus*. The carina appears to be of similar length and the intervals moderately convex, equal and smooth.

No measurements can be given as I have not sufficient material on which to base them, and I must also leave the species nameless.

CHŒRIDIUM.

C.? ebeninum.

The remains for which the above name is suggested, consist of the greater portion of the thorax, the two elytra in a fair state of preservation and a portion of the abdominal segments. These may be described as follows:

Thorax nearly twice as wide as long, sides feebly arcuate, gradually converging anteriorly, surface sparsely and finely punctate, pleuræ longitudinally finely strigose. Elytra rather wider, conjointly, than long, sides moderately arcuate and gradually narrowed to apex, disc with seven moderately impressed striæ, the outer rather distant from the margin; striæ entire and nearly parallel and equidistant. Intervals coarsely but sparsely punctured. Epipleuræ sparsely punctate. Abdomen with coarse punctures at the sides, smoother at middle.

Length of *thorax* .07 inch; 1.75 mm.

Length of *elytra* .14 inch; 3.5 mm.

I have been really at a loss to know to what genus to refer these remains. They were at one time considered to be *Saprinus*, but the number of the striæ and their character forbid such a reference. The species seems to have been rather smaller than our *Chœridium histeroides*, but undoubtedly resembled it in form. I would have referred the remains to *Canthon* near *perplexus*, but the thorax is by no means that of the genus.

PHANÆUS.

P. antiquus.

Elytra with feeble striæ, intervals moderately convex, surface slightly rugulose. Abdomen smooth. Length .40 inch; 10 mm.

A species is indicated somewhat larger than *carnifex*, the elytral sculpture is however, more nearly that of *Pluto*, inasmuch as the intervals are regularly convex, and the striæ not suddenly impressed at base. The remains consist of an impression with a small portion of the substance of both elytra in position, slightly separated at base by pressure so that a deceptive appearance of an elongate scutellum is presented; also the impression of the abdominal segments with a small portion of chitinous substance.

There is also the substance remaining of the greater portion of an elytron which probably belongs to the same species, in which the intervals are moderately convex and with traces of a few punctures, the striæ being moderately impressed and not punctured.

APHODIUS.

A. precursor.

Elytra smooth, shining, feebly striate, striæ shallow but rather wide; punctures distant, round near the apex, becoming transverse near the base, intervals flat, smooth.

A species is indicated of the size and nearly of the sculpture of *ruricola*. The scutellum is short. Length of *elytra* .10 inch; 2.5 mm.

Synoptic tables of some Genera of COLEOPTERA with notes and Synonymy.

BY GEORGE H. HORN, M. D.

The tables which follow are presented with the hope that they may prove useful to the students of the American fauna. During the lifetime of Mr. G. R. Crotch, the idea was suggested of preparing similar tables for as many of the genera as had not been so dealt with, should the species be amenable to such treatment. The death of Mr. Crotch seriously interrupted the work, and while many genera have been already published by myself, none of his have as yet appeared. The manuscript having been collected will be published as rapidly as my leisure will allow of its review. I have taken the liberty of making such additions to the manuscripts as seemed necessary to make them plainer or more useful.

ELAPHRUS, Fab.

A.—Anterior tarsi ♂ with four dilated joints; thorax sparingly punctate.
  B.—Elytra smooth impunctate.
    C.—Thorax beneath coarsely and sparsely punctate............**Clairvillei.**
    C. c.—Thorax beneath finely and more densely punctate.
      Legs piceous..**lævigatus.**
      Legs pale...**olivaceus.**
  B. b.—Thorax and elytra sparsely coarsely punctate............**cicatricosus.**
  B. bb.—Thorax and elytra sparsely and lightly punctate, foveæ feebly impressed..**obliteratus.**
  B. bbb.—Thorax evidently punctate, elytra punctate at sides, disc smooth. **fuliginosus.**
A. a.—Anterior tarsi ♂ with three joints dilated. Thorax and elytra very closely and finely punctate.
  B.—Thorax finely and closely punctate beneath.
    C.—Thorax broad, transverse, abruptly coarctate....................**Lecontei.**
    C. c.—Thorax cordate..**riparius.**
  B. b.—Thorax coarsely punctate beneath and more shining.......**ruscarius.**

The other changes in synonymy are as follows:

E. *politus*, Lec. = **Clairvillei,** Kby.
E. *Clairvillei*, ‡ Lec. = **fulginosus,** Say.
E. *intermedius*, Kby. = *californicus*, Mann. = **riparius,** Linn.
E. *intermedius*, ‡ Lec. = **Lecontei,** Crotch.
E. *obscurior*, Kby., doubtful, but probably a small **obliteratus,** Mann.

(G. R. Crotch).

E. olivaceus, Lec.

This species is of rather less slender form than *lævigatus*, but the sculpture of the upper surface resembles it very closely. The under surface of the pronotum is very densely punctulate, more so than the majority of the specimens of *riparius*. The type and only one known is a female, but its entire aspect appears to favor its reference to the group with *lævigatus* rather than with the last three species.

(G. H. Horn).

NOTIOPHILUS, Dum.

A.—Legs red..**æneus.**
A. a.—Tibiæ pale, femora metallic black.
  B.—Striæ geminate, interstices opaque.
    C.—Elytra three-foveolate..**semiopacus.**
    C. c.—Elytra one-foveolate..**nitens.**
  B. b.—Striæ uniform, interstices shining.
    C.—Elytra yellow at the sides..**sylvaticus.**
    C. c.—Elytra unicolorous.
      D.—Striæ entire, closely placed..**semistriatus.**
      D. d.—Striæ effaced at apex, intervals broader..**sibiricus.**
A. aa.—Legs entirely metallic black..**Hardyi.**
  N. *confusus*, Lec. = **sibiricus,** Motsch.

(G. R. Crotch).

BLETHISA, Bon.

A.—Thorax punctate above..**Julii.**
A. a.—Thorax smooth.
  B.—Thorax quadrate..**quadricollis.**
  B. b.—Thorax subcordate.
    C.—Thorax punctate beneath..**multipunctatus.**
    C. c.—Thorax smooth beneath..**oregonensis.**

(G. R. Crotch).

CARABUS, Linn.

A.—Thorax punctate beneath.
  B.—Fourth joint of anterior tarsi ♂ much smaller than the third. Elytra with margin not serrate near humerus..**Vietinghovii.**
  B. b.—Fourth joint transverse.
    C.—Elytra catenate, margin near base serrate..**palustris.**
    C. c.—Elytra foveolate, margin simple..**truncaticollis.**
A. a.—Thorax smooth beneath.
  B.—Posterior angles of thorax hardly produced..**Chamissonis.**
  B. b.—Posterior angles prolonged, rounded.
    C.—Elytra foveate.
      D.—Color black or brown; thorax narrowly margined..**tædatus.**
      D. d.—Black with violet margin; thorax broadly margined..{ **sylvosus.** **finitimus.**
    C. c.—Elytra catenate.
      D.—Elytra with margin serrate near the humeri..**serratus.**

D. d.—Elytra with simple margin.
E.—Elytral intervals equal, margin bluish........................**limbatus.**
E. e.—Elytra bronzed, four intervals forming slender costæ..**vinctus.**
(G. R. Crotch.)

C. sylvosus and *finitimus* differ in the latter being a broader and more robust species, the elytral margin more reflexed; the surface is smoother and more shining. These differences do not appear, however, to be of any very great value, as there are specimens in the cabinet of Mr. Ulke of such a form as to render it extremely doubtful to which of the two they should be referred. These differences find a parallel in *tardatus* and its varieties. (G. H. H.)

Clivina elongata, Rand., (*Randalli*, Lec.), does not differ from the *C. fossor*, Hbst., of Europe. All the specimens of this species collected in this country have occurred on the seaboard, Boston; it has probably been introduced. It is not common. (G. H. H.)

PERIGONA, Cast.

In September, 1875, among other synonymical notes, I spoke of the identity of *Trechichus umbripennis*, Lec., and *nigriceps*, Dej., and at the same time a confusion of generic nomenclature as indicated. M. Putzeys noticing the difficulty, has kindly sent me for study a specimen of *Perigona japonica*, Bates, and it is now possible to state definitely that our species is also a *Perigona*. In the arrangement of his collection, Chaudoir had always so placed our species, but not having any of our types with me, it was impossible until after my return to confirm by comparison my opinion of the specific identity of *nigriceps* and *umbripennis*.

Perigona, Cast., has for synonyms, therefore, *Trechichus*, Lec., *Nestra*, Motsch., and *Spathinus*, Niet.

Pentoplogenius, Morav., as a synonym, is from notes made by Dr. Leconte, and by a letter from M. Putzeys, I infer that *Somoplatus* is another thing, while nothing can be said at present of *Masoreus*, which by some strange accident I wrote *Mastigus*.

Perigona nigriceps, (Dej.), is the name of our insect.

PATROBUS, Dej.

In the *Annales Soc. Ent. Belg.*, XIV., 1871, Baron Chaudoir has published a review of the group Pogonides, which was entirely overlooked by me at the time I prepared the table of *Patrobus* of our country. (Trans. Am. Ent. Soc., 1875, p. 160). I cannot, however, see any valid reason for changing the views there expressed, that the species of *Patrobus* (*sensu*, Chaud.), in our fauna, are really variations of one species, excepting *longicornis*, Say. I can, therefore, hardly see how there is room to insert two other species between those which I have already placed together as synonyms. These two species are *obtusiusculus*, Chd., loc. cit., p. 43, Hudson's Bay, and *stygicus*, Chd., p. 46, Newfoundland; *Lecontei*, Chd., p. 47, is suggested for *rufipes*, || Lec., and is unnecessary if the preceding remarks be correct.

Our depressed species with quadrate thorax are placed by Chaudoir, in a new genus. *Platidius*, seems to have value rather as a sub-genus as *rugicollis*, Rand., is nearly intermediate in form between the true *Patrobus* and *Platidius*. (G. H. H.)

POGONUS, Dej.

This genus was first indicated in our fauna by Chaudoir, who in the Rev. et Mag. Zool., 1868, p. 64, described a species from Texas, (*texanus*, Chd.) The essential differences between *Patrobus* and *Pogonus* are, that the former has the head constricted more or less behind the eyes, and the latter has the middle and posterior tarsi sulcate above.

Since Chaudoir, two other species have been published by Leconte, *parallelus* and *depressus*, from Texas and California, respectively. (Trans. Am. Ent. Soc., 1874, p. 44).

In the review of the *Pogonides* above referred to, Chaudoir has subdivided the *Pogonus* of older authors into five genera, based on characters which seem most too finely drawn to be generally admitted as valid.

By the method of division followed by Chaudoir, our three species belong to different genera, the characters of which will be given below. It seems to me entirely unnecessary to multiply genera on such small differences, and science will be equally benefitted by indicating sub-generic groups without the burden of additional names. I therefore prefer to consider our species as constituting one genus, with three groups in our fauna.

The three genera above mentioned are as follows:

Mentum tooth deeply notched; ligula with a single bristle at tip.
  Epilobes of mentum acutely toothed.......................................**POGONUS.**
  Epilobes of mentum obtuse........................ ....**POGONISTES.**
Mentum tooth shorter and broader, feebly emarginate; ligula bisetose at tip.
  Epilobes of mentum obtuse..**DIPLOCHÆTUS.**

POGONUS as above defined has in addition the following characters:—Elytra with distinct basal marginal line, scutellar stria and three punctures on the outer side of the third interval.

POGONISTES.—Thorax cordate; form elongate, parallel. Elytra with feeble basal marginal line and scutellar stria. Dorsal punctures as in *Pogonus*.

DIPLOCHÆTUS.—Form of *Pogonistes*, thorax not narrowed at base. Prosternum broadly sulcate. Scutellar stria absent; basal marginal line obliterated at middle, forming at the humeri a moderately elevated recurved carina; striæ obliterated at base. Two dorsal punctures only, one median on the outer side, the other one-fourth from the apex on the inner side of the third interval.

Our species are as follows:

Pogonus texanus, Chd., Rev. Mag. Zool., 1868, p. 64; Annales Belg. XIV., p. 31.

P. (*Pogonistes*), **planatus,** = *depressus*, || Lec., Trans. Am. Ent. Soc., 1874, p. 44.

P. (*Diplochætus*), **Lecontei,** = *parallelus*, || Lec., loc. cit.

The name *depressus* is preoccupied in any case, whether the genus *Pogonistes* be adopted or not; *parallelus* is used already in *Pogonus*, and should the genus *Diplochætus* be adopted, may be allowed to remain. The latter species should be compared with *P. rutilus*, Chev., Am. Fr., 1873, p 197, it is possible that they may be identical.

(G. H. H.)

DYTISCIDÆ.

The discovery of *Anodochilus exiguus*, (Aube), in Florida, has given us the means of determining the fact that the genus indicated by Babington must be suppressed, and the presence or absence of the mentum tooth has very little value.

Hydroporus plicipennis, Crotch, is misplaced in the synopsis. Its position should be near *exiguus* in the group with basal thoracic and elytral plica.

In this section the sculpture of the metasternum, whether sulcate or not, will afford the means of grouping the species. The grooving of the metasternum is very much more common than Crotch supposed.

Dytiscus latissimus, Linn., should not be included in our lists. I am satisfied that the species was never alive on this side of the Atlantic, and from the number of specimens sent me from time to time for determination, identical with those of England and pinned on English pins, I am convinced that there must be either great carelessness or deception on some side. We have enough species legitimately introduced and now acclimated without bringing dead ones on pins. (G. H. H.)

HYDROCHARIS, Latr.

Prosternum acutely prolonged behind.
  Sixth joint of antennæ much larger than the seventh; maxillary palpi as long as the head and thorax..**castus.**
Prosternum not prolonged, obtuse at tip.
  Sixth joint of antennæ smaller than the seventh.
    Maxillary palpi as long as the head. Color of body piceous with faint tinge of bronze..**obtusatus.**
    Maxillary palpi short. Surface of body with glaucous coating...**glaucus.**

In *castus* the crest of the prosternum forms nearly a continuous line with that of the meso-metasternum, while in the other two species the two form a very oblique angle.

H. glaucus, Lec.—This species was first described as *H. lineatus*, Lec., Proc. Acad., 1855, p. 369, from a very badly discolored specimen of *glaucus*, the latter having been described six years later, Proc. Acad., 1861, p. 341. By an error of the pen the name *lineatus* appears as *H. substriatus*, List Col. N. A., 1863, p. 18. I adopt the later name *glaucus*, because it is more appropriate and belongs to the true species and not to a discolored variety, and also on account of the confusion of the other name. No injustice is done to the original describer and there is no intermediate synonymy.

H. grandis, Zimm., Trans. Am. Ent. Soc-, 1869, p. 250, is merely a female of *obtusatus*. (G. H. H.)

BEROSUS, Leach.

B. styliferus, Horn, should be removed from its present position in the list and placed near *infuscatus*. The last ventral segment is similarly toothed in the two species, my original description having been made from a specimen accidentally deformed. The mesosternal spine will at once distinguish it from any other species. (G. H. H.)

Sepidulum costatum, Lec., Trans. Am. Ent. Soc., 1874, p. 47, should be referred to EPIMETOPUS, Muls. (G. H. H.)

TROPISTERNUS, Sol.

Prosternal groove open anteriorly.
  Thorax and elytra with pale margin, the latter with discal yellow vittæ. **striolatus.**
Prosternal groove closed anteriorly.
  Thorax and elytra margined with yellow..1.
  Thorax and elytra unicolorous..2.
1.—Elytral limb suddenly broader at basal third..........................**limbalis.**
  Elytral limb narrow, equal..**lateralis.**
2.—Last ventral segment without spinous crest..3.
  Last ventral segment with spinous crest..4.

3.—Basal third of hinder femora opaque and finely punctured........**sublævis.**
Basal third shining and with very few punctures..5.
5.—Legs piceous, form more oval and convex..**ellipticus.**
Legs bicolored, form more oblong, less convex... ....**californicus.**
4.—Punctures of surface fine and equal...**glaber.**
Punctures coarser and unequal...**mixtus.**

T. striolatus.—Legs entirely testaceous except at base of femora. Last ventral segment without crest.

T. sublævis.—With this species should be placed *quadristriatus*, Horn.

T. glaber.—The punctures of the surface are very fine and equal, and do not dim the gloss of the surface.

T. mixtus.—The surface has a resemblance to that of *Dineutus vittatus*. Species other than *glaber* and *mixtus* often have a fine raised line on the last ventral segment, but no spiniform crest.

T. ellipticus, occurs at times with legs more or less bicolored, but its form more arched and more obtuse at each end will at once distinguish it.

T. lateralis.—Dr. Zimmerman (Trans. Am. Ent. Soc., 1869, p. 249), thinks that Say's name (*nimbatus*), should be retained, inasmuch as the two species do not appear to be identical. This must, however, be left for further determination. Herbst's *lateralis* is apparently an erroneous determination, and is *striolatus*, Lec. (G. H. H).

Anthrenus claviger, Er., must be included in our lists. It may be known by its five-jointed antennæ the club of which is formed of one long joint. It is usually confounded with *musæorum*, Linn , (*castaneæ*, Mels.), in cabinets. (G. H. H.)

A. scrophulariæ, Linn., has also been reported from the State of New York, where the larva has been found to be very injurious to carpeting in houses, (Lec., Proc. Acad., 1876, p. 195).

Aglenus brunneus, (Gyll.), another European insect has been collected in Missouri; Ulke.

Pyanisia opaca, Sol., and *Zophobas morio*, Fab., have occurred within our territory, the former in Texas, and the latter in Florida, abundantly.

Revision of the species of CHLAENIUS of the United States.

BY GEORGE H. HORN, M. D.

During the present year (1876), there has appeared an elaborate monograph of the species of *Chlaenius* by Baron Chaudoir, in the Annali del Mus. Civ. di St. Nat. di Genova, remarkable for its accuracy, perspicuity and evidences of great industry and analytical power. With the exception of two all our species were known in nature to him and these have been very accurately placed in his tables from the descriptions alone, and when it is considered that more than four hundred species have been tabulated, the magnitude of the labor becomes apparent.

There have been many new characters discovered and made use of in the definition of groups and other divisions, so that *Chlaenius* from being one of the more difficult genera for study, has been rendered as easy as it is possible to make one of such magnitude.

From among our species Chaudoir has removed *C. lithophilus*, Say, founding upon it a new genus BRACHYLOBUS, characterized especially by a peculiar conformation of mentum which will be spoken of hereafter.

The true *Chlaenius* are divided into three groups as follows:

I.—Abdomen at sides feebly or not at all punctulate, at middle smooth, glabrous.

II.—Abdomen punctulate, pubescent, middle usually smooth.

III.—Abdomen punctulate over the entire surface, pubescent.

The first group contains *tomentosus* and *cumatilis*, the second *prasinus*, *cordicollis*, *leucoscelis* and *solitarius*, while the third contains the remainder of the species, divided into smaller groups by characters of greater or lesser importance.

It cannot be expected that Chaudoir's monograph will reach the numerous students of our own country, and it has seemed to me desirable that the results of his study should be more widely known, and presented with such modifications as might seem desirable in reviewing the more limited number of species in our fauna.

Having about one-tenth of the entire number in our fauna it might be inferred that their arrangement would present less difficulty than the whole number, this must be my apology for adopting an arrangement entirely different from Chaudoir's, even after having spoken of the latter in the highest possible terms. My reason for seeking another method is, that while species in our fauna which are so evidently allied in many of their characters are widely separated, (e. g., *purpuricollis* and *niger*), others very dissimilar are placed in close proximity, (e. g., *tomentosus* and *cumatilis*).

Group III. will be seen to be composed of rather heterogeneous material. These remarks must not be interpreted as criticisms, except in the mildest sense, and it is probable that any method of classification based on a fauna as limited as our own will prove inadequate in the larger field.

Having become convinced that our species in which the thorax at base was as wide as the elytra, should be placed in proximity in any natural arrangement, the difficulty arose in finding some natural character which would associate them. This I at last found in the middle tibiæ of the males. In more than one-half of our species the males have a pubescent space of greater or less extent at the distal end of the middle tibiæ, which is usually on the outer edge sometimes in the front, the other species have glabrous tibiæ with merely the terminal fringe of fine spinules. With this as a starting point the divisions based on the punctuation of the abdomen and other characters made use of by Chaudoir can be more readily brought in.

The dilatation of the palpi in *purpuricollis* and *tomentosus*, seemed to me too important a character to lose sight of, and although no mention of it is made in the table, it should be given its proper weight in influencing the relative position of the species possessing it.

In our fauna *niger* is the central form of a group of species with a peculiar thoracic sculpture, formed of large punctures arranged at the sides, along the median line, and in and continuing the basal impression, the intervening spaces being smooth and more or less elevated. *C. tomentosus* even, preserves a trace of this sculpture.

C. cumatilis seems to associate more naturally with the *cordicollis* group, and would appear much out of place in our series near *tomentosus*.

Our other species possess no characters worthy of special comment, any peculiarities will be mentioned either in the table or the accompanying notes. Detailed diagnoses will not be given except where new species are described. In the arrangement of a cabinet it would probably be more natural to reverse the order of the table, this moreover would not greatly disturb the present position of most of the species.

As there are many species already well known to all collectors, these will be taken as the standards in speaking of color, so that the idea may be better conveyed.

The lateral margin of the elytra and basal line unite at the humerus, forming either a distinct angle or a regular curve. To avoid repetition of description, the expression in the former case will be "basal line angulate at humerus," and "arcuate at humerus" in the latter. The anterior femur of the male may have near the base a feeble tooth, or it may be subangulate, that is, suddenly narrowed, or it may be entirely simple, being gradually narrowed from the thickest portion toward either extremity. These expressions seem not to need any further explanation.

A.—Middle tibiæ ♂ without pubescent space at tip. Third joint of antennæ not longer than the fourth, (except in 1 and 2).

Abdomen impunctured and glabrous.

Thorax narrower at base than the elytra, sides distinctly sinuate, basal impressions deep, surface irregularly punctured..........1. **validus.**

Thorax as broad at base as the elytra, sides not sinuate, basal impressions very feeble, surface densely punctured.................2. **tomentosus.**

Abdomen sparsely punctured and pubescent over the entire surface.........1.

1.—Prosternum not margined at tip, thorax not sinuate............................2.

Prosternum margined at tip, thorax distinctly sinuate..........................3.

2.—Thorax with coarse punctures very irregularly disposed. Legs black...4.

Thorax more finely and densely punctured, subopaque. Legs red.........5.

4.—Prosternum punctured between the coxæ, elytra coarsely and rather densely punctured. Thorax as wide as base of elytra.....................6.

Prosternum impunctured, elytra finely punctured, thorax narrower.....7.

6.—Marginal line of elytra forming an angle with the basal line, margin of thorax not thickened......................................3. **purpuricollis.**

Marginal line of elytra regularly curved at base, margin of thorax thickened, especially toward the base.

Elytral intervals alternately more convex, but similarly punctured.
4. **alternatus.**

Elytral intervals equal..5. **niger.**

Striæ of elytra broken into short lines........................6. **interruptus.**

7.—Head greenish, thorax feebly bronzed, body and elytra black.
7. **harpalinus.**

5.—Thorax narrower at apex than base, and with narrow red margin.
8. **impunctifrons.**

———o———

3.—Thorax with impunctured spaces or unequally punctured.

Mandibles elongate, deflexed; thorax with very coarse, deeply impressed but sparsely placed punctures................9. **maxillosus.**

Mandibles normal in form.

Epipleuræ pale, thorax distinctly sinuate......10. **circumcinctus.**

Epipleuræ concolorous, thorax not sinuate..................11. **texanus.**

Thorax equally punctured. Epipleuræ dark.......................................8.

8.—Elytral intervals finely muricate. Prothoracic episterna coarsely punctured..........12. **pennsylvanicus.**

Elytral intervals finely and sparsely punctured and not distinctly impressed..........9.

9.—Prothoracic episterna coarsely punctured..........10.

Prothoracic episterna very obsoletely punctured..........11.

10.—Head and thorax green, varying to blue, shining.

Labrum emarginate.

Body above green, elytra rather densely punctulate.

13. **floridanus.**

Body above bicolored, elytra very obsoletely and sparsely punctulate.

14. **brevilabris.**

Labrum truncate..........15. **tricolor.**

Head and thorax coppery bronze, thorax subopaque.....16. **nemoralis.**

11.—Thorax shining, punctures coarse and numerous..........12.

Thorax opaque, punctures fine and very sparse..........13.

12.—Body above (head and thorax), metallic green, legs pale.

Thorax with feeble but evident sinuation. Labrum emarginate.

17. **glaucus.**

Thorax distinctly sinuate and narrower. Labrum truncate.

18. **simillimus.**

Thorax not sinuate. Labrum truncate..........19. **nebraskensis.**

Body above black or very slightly blue. Legs usually black.

20. **variabilipes.**

13.—Thorax not sinuate, base evidently broader than apex. Labrum truncate..........21. **vafer.**

Thorax sinuate, hind angles subacute, punctures more evident. Labrum feebly emarginate. Color above green..........22. **flaccidus.**

Thorax distinctly sinuate, base not broader than apex. Labrum emarginate..........23. **obsoletus.**

———o———

B.—Middle tibiæ ♂ with a pubescent space near the tip. Third joint of antennæ longer than the fourth.

Prothoracic epipleuræ very narrow and nearly vertical, thorax obtusely margined..........17.

Prothoracic epipleuræ normal, oblique or nearly horizontal, thorax acutely margined..........1.

1.—Abdomen either smooth at middle or over its entire surface..........2.

Abdomen sparsely punctured at middle and more densely at sides..........3.

2.—Abdomen punctured at sides only. Anterior femora of ♂ subangulate at base..........4.

Abdomen devoid of punctures..........5.

4.—Prosternum not margined at tip, feebly punctured or smooth in front...6.

Prosternum margined at tip, coarsely punctured in front..........7.

6.—Color bright green, shining.......... 24. **solitarius.**

Color dark blue, thorax subopaque, elytra opaque.......25. **leucoscelis.**

7.—Color green, last ventral segment nearly entirely testaceous.

26. **prasinus.**

5.—Prosternum feebly margined at sides of tip; episterna with coarse punctures; color violet blue, opaque..........27. **cumatilis.**

3.—Metasternal episterna long, outer side longer than the anterior............. 8.
Metasternal episterna short, outer side shorter than the anterior.......... 9.
9.—Thorax scarcely narrower at base than the elytra, sides not sinuate.....10.
Thorax narrower at base than the elytra, sides sinuate.........................11.
10.— Body above green (as in *sericeus*); legs entirely pale....28. **augustus.**
Body above bluish black; tibiæ and tarsi black.................29. **viduus.**
11.—Male with anterior femora subangulate at base.
Thorax as long as wide, sides distinctly sinuate...........30. **æstivus.**
Thorax wider than long, sides not sinuate...........31. **platyderus.**
Male with anterior femora simple..32. **diffinis.**
8.—Male with anterior femora toothed at base......................33. **laticollis.**
Male with anterior femora suddenly narrower at base....................... 12.
Male with simple femora.. 13.
13.—Legs black...34. **orbus.**
Legs testaceous.. 14.
14.—Thorax very densely punctate.. 15.
Thorax very sparsely coarsely punctate.
Prothorax beneath and abdomen very sparsely punctate...35. **cursor.**
Prothorax densely and coarsely punctured, abdomen moderately punctate...36. **Chaudoiri.**
15.—Thorax strongly sinuate, hind angles rectangular, base not broader than apex... 16.
Thorax very distinctly broader at base than apex, moderately or not sinuate.
Smaller species, (.52—.66 inch). Color green to blue, legs pale.
37. **sericeus.**
Larger, (.84—.90 inch). Color blackish, tarsi piceous.
38. **fuscicornis.**
12.—Thorax distinctly sinuate. Color and size of *fuscicornis*.
39. **erythropus.**
16.—Color black with tinge of blue, elytra very finely striate.
40. **viridifrons.**
17.—Body above unicolorous, thorax feebly narrowed at base.
41. **herbaceus.**
Elytra with apical third rufous, thorax coarctate at base.
42. **ruficauda.**

1. **C. validus,** Chev.—Body beneath black, above green. Head brilliant green, with few minute punctures, a deep wrinkled groove on each side in front, labrum truncate, antennæ rufous. Thorax wider than long, sides moderately arcuate in front, sinuate posteriorly, hind angles rectangular but not prominent, disc moderately convex, moderately densely punctured along the base and with coarser punctures along the median line, others arranged in two irregular rows from each basal impression, a few along the lateral margin and the middle of the apex; basal impressions deep, apical transverse impression very faint. Elytra broader at base than the thorax, basal line angulate at humeri, striæ moderately deep at base, gradually finer toward apex, punctures more evident at base, intervals finely but not densely punctured, sparsely pubescent. Prosternum not margined, smooth except along the anterior and lateral margins where there are coarse punctures, episterna smooth with a few coarse and deep punctures near the suture. Metasternal episterna long, smooth

with a very few (six to eight), large punctures. Abdomen entirely smooth. Length .60—.72 inch; 15—18 mm.

The head is entirely bright green, thorax with cupreous tinge, elytra olive green, opaque, extreme margin shining. The third joint of the antennæ is longer than the fourth and the palpi distinctly dilated.

I have seen two specimens of this species, one from Arizona, the other Mexican. The description was made from the former, which is brighter in color than the other. The description therefore differs slightly from that by Chaudoir.

2. **C. tomentosus,** (Say)—Color black, shining beneath, subopaque and feebly bronzed above. Head nearly smooth, a few punctures over each eye. Palpi elongate triangular, truncate at tip. Antennæ black, two basal joints pale, third joint longer than the fourth. Thorax gradually wider from apex to base, hind angles rectangular, base as broad as the elytra; disc with feeble basal impressions, densely punctured at sides and base, middle more coarsely punctured and with vaguely defined smooth spaces. Basal line of elytra angulate at humeri, striæ moderately deep, punctures rather coarse but not serrate, intervals feebly convex, finely not densely punctulate and pubescent. Prosternum margined at tip and longitudinally impressed in front ♂; episterna with coarse punctures in front. Metasternal episterna coarsely punctured, elongate, margined. Abdomen almost entirely smooth, not pubescent. Length .52—.60 inch; 13—15 mm.

Anterior femora simple in the male.

Occurs commonly, nearly everywhere east of the Rocky Mountains.

3. **C. purpuricollis,** Randall.—Color black beneath, dark violet blue above. Form similar to *tomentosus* but much smaller. Antennæ black, basal joint pale; palpi distinctly dilated and truncate at tip. Thorax gradually broader from base to apex, hind angles obtuse; surface coarsely punctured, punctures arranged at the sides, basal impressions and median line, intervening spaces more convex and smoother. Elytra not broader at base than thorax, basal line angulate at humeri, surface with fine striæ finely and distantly punctured, intervals with moderately dense, rather coarse, simple punctures. Prosternum sparsely punctured in front, episterna sparsely punctured. Metasternal episterna elongate, surface cribrate and with marginal impressed line. Abdomen sparsely punctured over the entire surface and sparsely pubescent. Length .36 inch; 9 mm.

Anterior femora of male simple. Palpi similar in the sexes, the labial slightly more dilated than the maxillary.

I cannot understand why Chaudoir has compared this species with *augustus*, as they seem to have very little in common.

Occurs from New York westward to Kansas, but rare.

4. **C. alternatus,** Horn.

I have very little to add to the original description. The form is exactly that of *niger*, but the thorax is less arcuate on the sides, the sculpture of the thorax does not however differ. The elytral intervals are alternately more convex, and the entire surface is covered with short black pubescence as in *niger*. The striæ are replaced by large vague punctures at middle, and at the sides are broken into short lines, basal margin arcuate at humeri. Prosternum very sparsely punctured, episterna smooth. Metasternal episterna long, sparsely punctured and margined. Abdomen as in *purpuricollis*. Length .50 inch; 12.5 mm.

Anterior femora of male simple. Labrum truncate.

One specimen ♂ from Saskatchewan region, others are in the cabinet of the British Museum.

5. **C. niger,** Randall.—Black rarely with a faint bronze tinge. Head smooth, a faint vertical puncture. Labrum emarginate. Antennæ black. Palpi slender. Thorax broader than long, apex narrower, sides regularly arcuate; margin with a thickened edge, base slightly narrowed, hind angles obtuse, surface with coarse punctures at the sides and base, along the median line, and in continuation of the basal impressions, intervening spaces smooth and moderately convex. Elytra striate, striæ finely punctured, intervals moderately convex, moderately densely punctured, sparsely clothed with short brownish pubescence with yellowish hairs very sparsely intermixed. Prothorax beneath sparsely punctured. Metasternal episterna sparsely punctured, margined. Abdomen sparsely punctured and pubescent. Length .50 inch; 12.5 mm.

Anterior femora of male simple.

Occurs from Canada to Louisiana and Florida.

6. **C. interruptus,** n. sp.—Body black above and beneath. Head as in *niger*, labrum subtruncate, antennæ black. Thorax nearly twice as wide as long, very little broader at base than apex, sides moderately arcuate, margin slightly thickened, disc moderately convex, basal impressions shallower than in *niger*, median line moderately impressed, surface punctured as in *niger*. Elytra relatively broader than in *niger*, striæ broken into lines of varying length. intervals punctured as in *niger* but with shorter less conspicuous pubescence. Body beneath entirely as in *niger*. Length .46 inch; 11.5 mm.

The upper surface is rather less shining than in *niger* and the form rather more robust, the labrum much less emarginate, and the thorax narrower at base and the sides much less depressed. The short lines into which the striæ are broken, are deeply impressed and the intervals between the rows convex.

I was at one time disposed to consider this as a deformed *niger*, but Mr. Ulke assures me that four specimens exactly alike have been taken, two of them in copulation.

Occurs in Washington County, Oregon. For the unique in my cabinet, I am indebted to Mr. H. Ulke, who kindly divided his pair with me.

7. **C. harpalinus,** Esch.—Body above and beneath black, head metallic green, thorax bronzed. Head minutely punctulate, labrum truncate, antennæ entirely black, palpi slender. Thorax quadrate, broader than long, sides moderately arcuate, surface punctured in a manner similar to *niger* but much less densely and deeply. Basal line of elytra arcuate at humeri, striæ moderately deep, indistinctly punctured, intervals feebly convex, moderately densely and rather finely punctured, sparsely clothed with short black pubescence. Prosternum nearly smooth in front, episterna obsoletely punctured. Metasternal episterna long, sparsely punctured and margined. Abdomen as in *niger*. Length .44 inch; 11 mm.

Anterior femora simple in the male.

Chaudoir describes the form of the thorax somewhat differently, but the form varies moderately and I have thought it better to use more general terms.

Occurs on the Pacific coast from Vancouver Island to San José, California.

8. **C. impunctifrons,** Say.—Body black, head brilliant green, thorax greenish, subopaque, elytra black, opaque, legs rufo-testaceous. Head nearly smooth, labrum truncate, antennæ rufo-testaceous. Thorax broader than long, base slightly broader than apex, sides moderately arcuate with narrow red edge, hind angles obtuse, surface subopaque, moderately densely but finely punctured, sparsely pubescent, median and basal lines finely impressed. Elytra with basal line very feebly subangulate at humeri, striæ rather deep, moderately punctured, intervals flat, finely and moderately densely punctulate sparsely clothed with short pale pubescence. Prosternum moderately coarsely punctured, episterna more finely. Metasternal episterna elongate, sparsely punctured, margined. Abdomen as in *niger*. Length .52—.62 inch; 13—15.5 mm.

Anterior femora of male simple.

This species is peculiar in having a very flat thorax, of a form not very different however, from *niger*. It must be considered out of line in any attempt at a linear arrangement of our species.

Occurs from Canada to Texas.

9. **C. maxillosus,** n. sp.—Body beneath piceous, legs pale, above black with slight violet tinge. Head smooth, with slightly bluish tinge, labrum truncate, mandibles elongate, feebly arcuate, deflexed; antennæ rufous, three basal joints paler, third joint very little longer than the fourth. Thorax broader than long, base wider than apex, sides regularly arcuate, not sinuate, disc moderately convex, coarsely, deeply and very irregularly punctured, intervals smooth. Elytra oblong oval, basal line arcuate at humeri, deeply striate, striæ indistinctly punctured except at base, intervals convex, very sparsely and irregularly punctate, sparsely pubescent. Prosternum margined at tip, coarsely punctured, episterna coarsely punctured. Metasternal episterna coarsely punctured. Abdomen as in *niger*. Length .40 inch; 10 mm.

This species is peculiar in many respects. The mandibles are more elongate and less arcuate than in any species in our fauna, resembling those of *Anomoglossus* but even longer, the ligula more exsert but normally formed. The mentum tooth does not differ from that of many others, being rather broad at base and slightly impressed at tip. The palpi do not differ from *pensylvanicus* and its allies. The entire oral apparatus seems to be more elongated, but beyond this no generic character is presented. The elytral sculpture is also entirely unlike any of our others. The punctures are distributed nearer the sides of the intervals, and a feeble attempt appears in the inner intervals at a biseriate arrangement.

I have before me two females collected by Messrs. Hubbard and Schwartz, at Lake Harney and Haulover, Florida. The males might give another generic determination.

10. **C. circumcinctus**, Say.—Body beneath black, above green, elytra darker, legs rufo-testaceous. Head minutely punctulate, labrum truncate, palpi slender, antennæ brownish, three basal joints pale. Thorax broader than long, margin narrowly rufous, sides arcuate in front, feebly sinuate posteriorly, hind angles acute, not prominent, surface coarsely but sparsely punctured at the sides, base, along the median line and in continuation of the basal impressions, intervening spaces smooth and more convex. Elytra feebly shining, basal line feebly subangulate at humeri, margin narrowly rufous, epipleuræ pale; surface with finely punctured striæ, intervals flat, finely and not densely punctulate and with rufous pubescence. Prosternum punctured in front, margined at tip, episterna sparsely obsoletely punctate. Metasternal episterna long, margined, sparsely punctate. Abdomen punctured as in *niger*, bordered with rufous at the tip and sides posteriorly. Length .40—.44 inch; 10—11 mm.

This species in its thoracic sculpture is the final and most feeble imitation of that of *niger*, and may be considered the link from that species to those which follow.

Although I am an advocate of the right of priority in nomenclature, the fact has always been patent to me that there are certain cases in which it should not be admitted. The present instance is one of these. Dejean first described this species (fidè Chaudoir), under the name *perplexus*, from a discolored specimen which he indicated from Senegal. I hold in such cases that where everything is calculated to mislead, the description should be dropped as invalid and the earliest proper diagnosis accepted. I therefore adopt Say's name, although probably a year younger

Occurs in the Gulf States and Cuba.

11. **C. texanus**, n. sp.—Body beneath black, legs pale, above bluish green, elytra darker. Head very minutely punctulate, an obsolete vertical puncture, labrum truncate, antennæ brownish, three basal joints pale. Thorax wider than long, narrower in front, apex very feebly emarginate, sides arcuate and slightly

narrowing at base, hind angles obtuse, disc moderately convex, median line feebly but broadly impressed, basal impressions short, moderately deep, surface coarsely and sparsely punctured, punctures denser at the base, less numerous at the sides and along the middle. Elytra similar in form to *memoralis*, finely but moderately deeply striate, striæ punctured, intervals flat, moderately densely and finely punctured, and sparsely clothed with short, pale rufous pubescence. Prosternum in front sparsely punctured, tip margined, episterna obsoletely punctured. Metasternal episterna sparsely submuricately punctured, elongate, margined. Abdomen as in *niger*. Epipleuræ black. Length .50 inch; 12.5 mm.

The color of the upper surface is nearly that of *cordicollis*, but with head and thorax more brilliant. The basal marginal line is rounded at the humeri, the third joint of the antennæ not longer than the fourth.

I have in my cabinet one of each sex, the male having unfortunately lost the middle tibiæ. I feel very certain of its position in the present group from the thoracic sculpture, and the form of the third joint of antennæ and the rounded basal line. These three characters taken together are in our fauna of equal value, with the absence of pubescence on the male middle tibia.

Occurs in Texas. Two specimens kindly given me by Mr. F. G. Schaupp, of Brooklyn.

12. **C. pensylvanicus**, Say.—Beneath black, legs pale, above green, elytra darker. Head brilliant green, minutely punctulate, labrum feebly emarginate, palpi slender, antennæ rufous, three basal joints paler. Thorax bright green, very little wider than long, sides moderately arcuate, feebly sinuate posteriorly, hind angles acute not prominent, margin narrowly rufous, disc moderately convex, basal impressions linear moderately deep, median line finely impressed, surface with coarse punctures not very densely placed. Elytra striate, striæ punctured, intervals flat, moderately densely muricately punctured, and with short, brownish pubescence, basal line arcuate at humeri. Prothorax beneath coarsely but sparsely punctured, prosternum margined at tip. Metasternal episterna coarsely and sparsely punctured, margined, form elongate. Abdomen as in *niger*. Length .40—.44 inch; 10—11 mm.

Anterior femora of male simple.

I have seen a variety of this species in the cabinet of Mr. H. Ulke, entirely green, nearly as in *prasinus*, and which was from California.

Occurs principally in the Northern States and Canada, also California and Oregon.

This species having the prosternal episterna coarsely punctured, can only be confounded with the next three species. The elytral punctures being very distinct and submuricate in this, and very feeble in the others, will serve to distinguish it.

13. **C. floridanus**, n. sp.—Body beneath black, above green as in *sericeus*, legs pale. Head nearly smooth, labrum emarginate, antennæ pale. Thorax much broader than long, very little wider at base than apex, sides regularly arcuate with very feeble trace of sinuation posteriorly, margin very narrowly rufous, disc moderately convex, surface coarsely and moderately densely punctured, less densely at middle. Elytra of the form of *tricolor*, striate, striæ distinctly punctured, intervals densely punctulate, and with very short, reddish-brown pubescence. Prosternum margined at tip, coarsely punctured in front, episterna coarsely but rather indistinctly punctured. Metasternal episterna long, sparsely punctate. Abdomen as in *niger*. Length .48 inch; 12 mm.

The sculpture of the elytra is much more distinct than in any of the species of this group which follow, but not submuricate as in *pensylvanicus*, but very closely resembling that of *sericeus*. The thorax has nearly the outline of *impunctifrons*, but is more convex, and is of nearly the same size, relatively to the elytra.

The labrum is rather more emarginate than in *brevilabris*.

Three specimens, two ♀ Leconte, one ♂ Ulke, from Florida.

14. **C. brevilabris**, Lec.—Form and color of *pensylvanicus*, elytra bluish-black. Head and thorax similarly sculptured. Elytral intervals flat, finely and indistinctly punctured. Body beneath as in the preceding. Length .40—.48 inch; 10—12 mm.

Anterior femora of male simple. Labrum feebly emarginate.

Chaudoir adopts the name *quadricollis*, Kby., for this species having been misled by a note published by Dr. Leconte, in the Ann. Mag. Nat. Hist., Nov., 1870. This error was subsequently corrected, Proc. Acad., 1873, p. 325.

This species occurs in Illinois, Texas, Iowa, New Mexico, Colorado.

15. **C. tricolor**, Dej.—Similar in form to *pensylvanicus*, elytra black with very faint tinge of blue. Head green, slightly bronzed, labrum truncate. Thorax narrower at apex than base, broader than long, sides arcuate and feebly sinuate posteriorly, hind angles acute, not prominent; basal impressions fine, moderately deep; surface rather coarsely and densely punctured. Striæ of elytra fine but moderately deep, finely punctured, intervals flat, finely, moderately densely, but very indistinctly punctured. Body beneath as in *pensylvanicus*. Length .46—.52 inch; 11.5—13 mm.

The color of the head and thorax are apt to vary in this species and from green become cupreous. It is very closely allied to the next species and differs by feeble characters.

Occurs everywhere east of the Rocky Mountains, from Canada to Texas, and thence through Arizona to San Diego, California.

16. **C. nemoralis**, Say.—Closely allied to *tricolor*, but differs as follows: Head and thorax coppery bronze, (very rarely greenish), the latter always more or less subopaque and more finely punctured, anteriorly more convex, median line distinctly impressed in its entire length. Elytra black without

bluish tinge, intervals very finely and sparsely punctured. Length .44—.52 inch; 11—13 mm.

In the specimens from the Southern States, which are by far the best representatives of the species, the thorax is more decidedly sinuate behind, and the hind angles moderately prominent.

Occurs from Canada to Texas.

17. **C. glaucus**, Lec.

This species is closely allied to the preceding and differs in the labrum being distinctly emarginate, the thorax evidently sinuate near the base, the elytral striæ deeper and more closely punctate.

The color is variable. The head and thorax are usually bluish-green, the elytra bluish as in *tricolor*. A specimen in my cabinet is however, entirely green as in *nebraskensis*. Length .44—.50 inch; 11—12.5 mm.

Chaudoir says the labrum is truncate, but it will be found as stated above. The male specimen of which he makes special mention is now before me, and it bears his own label, (*sericinitens*).

Occurs at Fort Yuma, California.

18. **C. simillimus**, Chaud.

Closely allied to the two preceding, differing from *nebraskensis* in having the thorax distinctly sinuate posteriorly, and the hind angles acute. From *glaucus* it differs in its truncate labrum. The thorax is relatively narrower than in either and more decidedly narrowed posteriorly, and the hind angles more acute. Its form is more slender also, and recalls *obsoletus*. The head and thorax are green, the elytra black with slight bluish tinge. Length .46 inch; 11.5 mm.

The unique before me is from Chaudoir, collected at San Francisco, California.

19. **C. nebraskensis**, Lec.—Body beneath black, legs pale, body above green, similar to *sericeus* but slightly darker. Head minutely punctulate, antennæ rufous, paler at base, labrum truncate. Thorax broader than long, sides moderately arcuate, posteriorly not sinuate, hind angles distinct, not acute, base and apex nearly equal, surface coarsely punctured, sparsely on the disc, more finely and densely at sides and base, sparsely pubescent. Elytra finely striate, striæ finely punctured, intervals flat, finely and sparsely obsoletely punctate, and with rufous pubescence, basal line rounded at humeri. Prosternum margined at tip, coarsely punctured in front, episterna very obsoletely punctured. Metasternal episterna long, margined, and moderately densely punctulate. Abdomen as in *niger*. Length .42—.52 inch; 10.5—13 mm.

This species resembles *brevilabris* in form, but differs in color and punctuation of prosternal episterna.

Occurs in the region between the Mississippi River and the Rocky Mountains from Dakota to Texas, also in Utah and Nevada.

20. **C. variabilipes,** Esch.—Form similar to *nebraskensis* or *brevilabris.* Body beneath and above black, rarely with a bluish tinge above, legs usually black but varying to testaceous. Head very minutely punctulate, antennæ piceous, basal three joints often paler, labrum feebly emarginate. Thorax as in *nebraskensis* slightly more sinuate posteriorly, hind angles subacute, surface coarsely and sparsely punctured, slightly more densely along the base, sparsely pubescent. Elytra finely striate, striæ finely punctured near the base, intervals flat, sparsely obsoletely punctulate and sparsely pubescent. Prosternum feebly margined at tip, punctured in front, episterna very obsoletely punctulate. Metasternal episterna long, margined, moderately densely punctulate. Abdomen as in *niger.* Length .40—.46 inch; 10—11.5 mm.

The legs of this species are usually black but with many variations between this and rufous. When the legs are pale the palpi and basal joints of the antennæ are the same. The prosternum is more feebly margined at tip than any of the associated species.

This species is widely distributed in California.

21. **C. vafer,** Lec.—Body beneath black, legs pale. Head metallic blue or violet. very minutely punctulate, antennæ rufous, three basal joints paler, labrum truncate. Thorax bluish, subopaque, very sparsely and finely punctulate and sparsely pubescent, in form resembling *nebraskensis.* Elytra of color and sculpture of *nemoralis.* Prosternum margined at tip, in front punctured, episterna nearly impunctured Metasternal episterna long, punctured and margined. Abdomen as in *niger.* Length .48 inch; 12 mm.

The general resemblance of this species to *nemoralis*, the color together with the finely and sparsely punctured thorax, will serve to distinguish it.

Occurs in Texas.

22. **C. flaccidus,** n. sp.—Body beneath black, legs pale, above entirely green as in *nebraskensis.* Head moderately shining, minutely punctulate, labrum with very feeble emargination, antennæ brown, three basal joints pale. Thorax broader than long, sides moderately arcuate in front, distinctly sinuate posteriorly, hind angles acute, base very little broader than apex, median line and basal impressions moderately distinct, surface subopaque, sparsely and not deeply punctured, sparsely pubescent. Basal line of elytra arcuate at humeri, striæ fine moderately closely punctured, intervals flat, finely and moderately densely punctured, sparsely pubescent. Prosternum margined at tip, punctured in front, episterna very obsoletely punctate. Metasternal episterna moderately densely punctured and margined. Abdomen as in *niger*, margined with testaceous at tip. Length .44 inch; 11 mm.

This species in the form of thorax occupies an exactly intermediate position between *vafer* and *obsoletus.* The thorax is not as opaque as in either of these but is by no means shining, the lustre being about that of *leucoscelis.* There may be observed on the disc of the thorax a smooth line starting from the end of each basal impression and converging forward, this line is devoid of punctures and is defined by the punctures on each side of it being rather more closely placed. In color, and considerably in form, this species resembles *nebraskensis*, but the thorax of the latter is so much more coarsely and densely punctured and the surface shining. Mr. Ulke has a variety with the elytra bluish.

One specimen ♀, collected by Belfrage, in Waco County, Texas.

23. **C. obsoletus,** Lec.—Body beneath black, legs pale. Head blue, shining, minutely punctulate, labrum emarginate, antennæ rufous, paler at base. Thorax slightly broader than long, base very little broader than apex, sides arcuate in front, moderately deeply sinuate posteriorly, hind angles slightly obtuse, surface subopaque, bluish, with sparsely placed, rather coarse but vague punctures, sparsely pubescent. Elytra with fine striæ not visibly punctured except near the base, intervals flat, sparsely and finely punctured. Body beneath as in *vafer*. Length .42 inch; 10.5 mm.

Chaudoir is undoubtedly correct in recognizing this as a distinct species, as Dr. Leconte himself did in the first instance.

Occurs principally in the southern portions of California, but specimens have occurred as far north as Mariposa.

24. **C. solitarius,** Say.—Above bright green, moderately shining. Labrum truncate. Antennæ with third joint longer. Thorax slightly longer than wide, base and apex equal, sides moderately strongly arcuate in front, sinuate behind, hind angles rectangular slightly obtuse, surface rather sparsely punctured along the base, median line and apical impression. Basal line of elytra arcuate at humeri, striæ moderately impressed, punctured, intervals flat, sparsely punctulate and pubescent. Prosternum with feeble trace of marginal line at tip, in front very sparsely punctured, side pieces with few punctures. Metasternal episterna feebly margined, more strongly in front, sparsely punctured. Abdomen sparsely punctured and pubescent at the sides, smooth at middle, last segment margined with testaceous. Legs pale. Length .48—.56 inch; 12—14 mm.

In the male the anterior femora are distinctly subangulate at basal third.

This is the only species in our fauna in which the elytra when deprived of pubescence are as shining as the thorax.

Occurs from Canada to Louisiana, Colorado and New Mexico.

25. **C. leucoscelis,** Chevr.—Dark violet blue. Labrum truncate. Thorax as in *solitarius*, subopaque, sparsely punctured along the base, median line and in front, basal impressions long, arcuate. Elytral intervals moderately densely and finely punctulate, sparsely pubescent. Prosternum not margined at tip, in front smooth, episterna obsoletely punctured. Abdomen as in *solitarius*, last segment paler along the margin. Length .50—.60 inch; 12.5—15 mm.

Male with anterior femora subangulate at base.

After a careful study of specimens from Canada, the Western States, Arizona, California and Mexico, I feel the necessity of uniting *leucoscelis* and *cordicollis*.

The differences on which Chaudoir relies for separating the species are certainly very evanescent, such as a little more punctuation of the sides of the vertex and thorax. As might be expected, the northern forms are somewhat more rugose than the southern, but the smooth head is by no means constant in the southern forms. The little variation in the form of the thorax is not worth consideration, as there is in nearly every species an equal, and in many, a greater amount than here. From the inquiry I have made, I find that my correspondents separate the two above named almost entirely by the locality label. In reply to a note, Mr. Ulke stated, that were the locality labels removed from his series he would be entirely unable to separate them.

Chevrolat's name appears to have priority by several years, and I have adopted it.

From what has been already stated, this species is widely distributed over the United States and Mexico.

26. **C. prasinus,** Dej.—Body beneath black, legs pale, last ventral and margins of the two preceding segments testaceous, legs pale; above bright green as in *sericeus*. Head behind the eyes rather coarsely punctured, labrum truncate. Thorax broader than long, sides arcuate in front, gradually narrowed to base and not sinuate posteriorly, hind angles obtuse, disc coarsely but sparsely punctured, more densely at apex and base. Basal line of elytra arcuate at humeri, striæ finely punctured, intervals moderately densely and finely punctured and sparsely pubescent. Prosternum margined at tip, coarsely punctured in front, episterna moderately densely and finely punctured. Metasternal episterna long, margined, moderately densely punctulate. Abdomen as in *solitarius*. Length .68 inch; 17 mm.

Male with anterior femora subangulate at base.

Occurs from the Middle States westward to Colorado and to Texas.

27. **C. cumatilis,** Lec.—Body beneath black, legs pale, above opaque blue similar to *leucoscelis*. Head sparsely punctured except at middle of front, labrum truncate, antennæ rufous, three basal joints paler. Thorax similar in form to *leucoscelis* but longer and less convex, surface opaque with very sparsely placed coarse punctures, hind angles obtusely rectangular. Elytra finely striate, striæ finely and distinctly punctured, intervals flat with scarcely any traces of fine punctures and with very little pubescence, basal line angulate. Prosternum margined at tip, in front punctured, episterna coarsely but sparsely punctured. Metasternal episterna elongate, margined, moderately densely punctured. Abdomen almost entirely devoid of punctures and pubescence as in *tomentosus*. Length .50—.58 inch; 12.5—14.5 mm.

Anterior femora of male simple.

This species may also be considered an odd member of our fauna. With our species only under consideration, I am compelled to associate it with the *leucoscelis* group.

Occurs in southern California, (San Diego, Santa Isabel, Vallecita), extending into the Peninsula.

28. **C. augustus,** Newm.—Body beneath black, above entirely bright green as in *sericeus*. Head coarsely and deeply punctured except the epistoma and middle of front, labrum truncate, antennæ piceous, three basal joints pale. Thorax broader than long, broader at base than the apex, sides in front arcuate, posterior third subparallel, disc moderately convex, evenly and very densely punctate, basal impressions obsolete. Elytra scarcely broader than the thorax, basal line angulate at humeri, striæ fine and finely punctate, intervals flat, moderately densely punctate and sparsely pubescent. Prosternum margined at tip, in front densely and coarsely punctate, episterna coarsely punctured. Metasternal episterna very short, coarsely punctate. Abdomen coarsely punctured at the sides, less coarsely at middle. Legs testaceous, tarsi darker. Length .68 inch; 17 mm.

This species may be called an elongate *tomentosus* in form, nor does the resemblance cease here, the palpi being decidedly more dilated than is usual in the present group. The anterior femora of the male are rather suddenly narrowed at base.

I have seen but two specimens ♂ ♀, in the cabinet of Dr. Leconte, from Georgia.

29. **C. viduus,** Horn.—Agrees with *augustus* in sculpture, but is somewhat more elongate in form. Color beneath black, femora testaceous, tibiæ and tarsi black, above black with tinge of violet. The punctuation of the thorax is a little less dense and that of the elytra rather more so. Antennæ black, except basal joint. Sculpture beneath as in *augustus*. Length ♀ .68 inch; 17 mm.

Two specimens only have been collected. The male is in the possession of Dr. S. V. Summers, who collected the species in Missouri, probably near St. Louis.

30. **C. æstivus,** Say.—Head and thorax green, slightly bronzed, elytra black with bluish tinge. Head punctured as in *augustus*. Thorax nearly as long as wide, base broader, sides with feeble sinuation posteriorly, disc coarsely and densely punctured. Elytra striate, striæ punctured, intervals finely, moderately densely but not very distinctly punctulate. Prosternum and side pieces nearly as in *augustus*. Length .64—.68 inch; 16—17 mm.

The anterior femora of the male are rather strongly subangulate near the base. The thorax of the female is usually broader than that of the male.

The short metasternal episterna and subangulate male femora, will readily distinguish this species from any of those with which it might be confounded.

Occurs principally in the Middle States region, and is not rare.

31. **C. platyderus**, Chaud.—Body beneath black, legs pale, above violet-blue, elytra slightly darker. Head coarsely punctured posteriorly and above the eyes. Antennæ rufous, three basal joints paler. Thorax broader than long, base broader than apex, sides in front feebly arcuate, posteriorly slightly converging but not sinuate, basal impressions feeble, surface densely and coarsely punctured. Elytra finely striate, striæ distinctly punctured near the base, becoming finer toward the apex, intervals flat, moderately densely and finely punctured, sparsely pubescent. Prosternum margined at tip, coarsely punctured in front, episterna coarsely but not densely punctured. Metasternal episterna short, coarsely punctured. Abdomen as in *niger*. Length .58 inch; 14.5 mm.

Male with anterior femora rather strongly subangulate at base.

Chaudoir has provisionally placed this species as a synonym of *diffinis* with these words: "I here reunite provisionally *platyderus*, of which the thorax is more flat, also the disc of the elytra, because I know at this moment but one individual." This one individual was probably a female. The differences besides those mentioned above are, thorax more densely punctured and broader, and especially the anterior femur of the male, where the subangulation is as distinct as in *æstivus*, while in *diffinis* the the femora are absolutely simple. I have no hesitation whatever in separating this as a distinct species.

Occurs in Illinois, Kan., Nebraska, N. Mex. and Indian Territory.

32. **C. diffinis**, Chaud.—Beneath black, legs pale, above bluish with a tinge of green, elytra darker. Head coarsely punctured, smooth at middle and in front. Antennæ brown, three basal joints paler. Thorax nearly as long as wide, base very little broader than apex, sides in front moderately arcuate, behind slightly converging, not sinuate, disc moderately convex, densely and coarsely punctured. Elytra striate, striæ with rather distant punctures, intervals flat, moderately densely punctulate. Prosternum, side pieces, and abdomen as in the preceding. Length .50—.60 inch; 12.5—15 mm.

Anterior femora of male simple.

This is the species which we have called *laticollis*, Say, and which Chaudoir emphatically denies. It appears that Say sent specimens of his species to Dejean, the collection of the latter is now in the possession of Chaudoir. It cannot be denied that Say has on several occasions distributed and named specimens which were not identical with his types. It is barely possible that an error of the latter kind may have occurred in this instance, but the fact still remains that a type if we may call it so, of *laticollis*, is now in the collection of Chaudoir. Whatever predilections we may have in favor of our own determinations of Say's species, I hardly think it safe to deny the validity of the sole remaining specimen which has been labelled by him. I therefore adopt the present name.

Occurs in the Middle States region.

33. **C. laticollis,** Say.—Very like the preceding species and differs in having a broader thorax, very feebly sinuate near the base, disc rather less densely punctured and more convex. Antennæ entirely rufous. Body beneath as in *diffinis*. Metasternal episterna long. Length .50—.62 inch; 12.5—15.5 mm.

Anterior femora of male with a short spine near the base.

This species is the *rufipes* of our present collections. The name must, however, be suppressed for reasons given under the preceding species.

Occurs from New York to Arizona and Florida. The specimens from Arizona are smaller than those from Texas and Louisiana, and the color above is an uniform dark violet-blue.

34. **C. orbus,** Horn.—Body beneath and legs black, above black rarely with a bluish tinge. Antennæ entirely black. Similar in form to the preceding but with a broader thorax, not sinuate posteriorly. The elytral striæ are very fine, and the punctures distinct but distant, intervals very finely, sparsely but indistinctly punctured. Body beneath as in *diffinis*. Metasternal episterna long. Length .60—.68 inch; 15—17 mm.

Anterior femora of male simple beneath.

There need be no difficulty in distinguishing this species. It is the only one in our fauna in this group, with black legs.

Occurs only in Texas, the other locality given by Chaudoir is erroneous, as Fuch's specimens were in all probability from Belfrage, and not collected in the "Etats du centre."

35. **C. cursor,** Chevr.—Beneath black, legs pale, above bluish-green. Head very sparsely punctate, antennæ rufous. Thorax similar in form to *viridifrons*, rather more convex, hind angles more obtuse, disc more shining and with coarse punctures very sparsely scattered. Striæ extremely fine, intervals sparsely and very obsoletely punctulate. Prosternum scarcely margined at tip, in front sparsely punctate, episterna coarsely punctate. Metasternal episterna as in *viridifrons*. Abdomen more sparsely punctate at middle than usual in the group. Length .54 inch; 13.5 mm.

Occurs in the south of California, also in the Peninsula and in Mexico.

The metasternal episterna are shorter than usual, but not to the extent seen in the *diffinis* group.

36. **C. Chaudoiri,** n. sp.

This species so nearly resembles the eastern forms of *sericeus* as to need no description, the differences being as follows:

Thorax very little wider than long, surface with very coarse punctures rather sparsely placed, and rather more shining. Length .60 inch; 15 mm.

The color is bright green as in our ordinary forms of *sericeus*, the head similarly punctured, and the striæ and punctuation of the elytra the same. The anterior femora of ♂ are as in *sericeus*.

One specimen ♂ in my cabinet from Texas, another a ♀ with Dr. Leconte, from Tamaulipas, Mexico.

37. **C. sericeus,** Forst.

This species is so well known to every collector as to need but little mention.

The head is punctured as in *diffinis*. Antennæ usually pale, frequently (*regularis*), with the outer joints darker. The thorax varies greatly in form, being nearly quadrate at times or as broad as in *laticollis*. The punctuation is moderately coarse, very dense and rather deeply impressed. Striæ fine and with rather fine, distant punctures, varying but little in size from base to apex; intervals moderately densely but finely punctate. Prosternum scarcely margined at tip, in front coarsely and densely punctured, episterna coarsely and less densely punctured. Metasternal episterna long, moderately coarsely and densely punctate. Abdomen more densely punctured at sides than at middle. Length .50—.68 inch; 12.5—17 mm.

The anterior femora of the ♂ although rather rapidly narrowed at base, can hardly be called subangulate.

The color of the upper surface is subject to very great variation. The specimens from the east of the Rocky Mountains and those from Oregon are bright green, and as we go farther south in the Pacific region the specimens become gradually darker, and two in my cabinet are nearly of the color of *diffinis*. These darker forms are called *regularis*, Lec., Chaudoir having suggested their identity with *sericeus*, After a careful study of a large series in my cabinet, I am convinced that there is no character by means of which they may be separated. Certain forms approach *viridifrons* but the latter has a much longer thoracic sinuation, and the base is scarcely narrower than the apex, and the form more depressed.

Occurs everywhere in the United States and Canada.

38. **C. fuscicornis,** Dej.—Body beneath black, above black with faint tinge of blue, legs pale, tarsi piceous. Head rugulose at the sides, punctured behind, middle smoother. Antennæ brown, two basal joints paler. Thorax as long as wide, base broader than apex, sides moderately arcuate in front, slightly narrowed but not sinuate posteriorly, surface densely and rather coarsely punctured. Striæ fine and finely punctured, intervals flat and rather densely punctulate. Prosternum not margined at tip, coarsely but sparsely punctured in front, episterna coarsely punctured. Metasternal episterna long, moderately densely punctured. Abdomen as in *sericeus*. Length .84—.90 inch; 21—23 mm.

Anterior femora of ♂ simple at base.

This and the next are our largest species.

Occurs in the Gulf States, also Illinois and Missouri.

39. **C. erythropus**, Germ.—Resembles the preceding and differs in having the thorax narrower, distinctly sinuate posteriorly, the antennæ always paler. Size as in the preceding.

The anterior femora of male subangulate at base.

Occurs from Ohio to Nebraska and Louisiana.

Some specimens collected by Mr. H. A. Brous, in Kansas, have a decidedly bluish tinge.

40. **C. viridifrons**, Esch.—Body beneath black, above variable, usually dark blue, often with the head and thorax slightly greenish. Head punctured as in *sericeus*, antennæ rufous. Thorax broader than long, base scarcely wider than apex, sides arcuate in front, rather strongly sinuate behind, hind angles rectangular, disc rather flat, densely punctured, rather more sparsely on each side of middle. Elytra slightly obovate, striæ extremely fine, distantly punctured, intervals finely but not densely punctulate. Prosternum feebly margined at tip, sparsely punctured in front, episterna sparsely punctate. Metasternal episterna moderate densely punctured. Abdomen as in *sericeus*. Legs pale. Length .50—.56 inch; 12.5—14 mm.

Anterior femora of male simple.

The metasternal episterna in this species are less elongate than in the majority of those with which it is associated, but by no means as short as in *diffinis* and its allies, the outer side still remaining somewhat longer than the anterior.

This species occurs in California, more commonly south of the latitude of San Francisco.

41. **C. herbaceus**, Chevr.—Body beneath black, legs pale, above bright green, elytra slightly darker. Head coarsely punctured posteriorly, wrinkled above the eyes, middle and front nearly smooth, labrum truncate, antennæ rufous. Thorax as long as wide, sides moderately arcuate in front, a long sinuation posteriorly, hind angles rectangular, disc convex, basal impressions moderate, surface regularly covered with deep coarse punctures. Elytra finely striate, striæ with fine rather distant punctures, intervals very finely and sparsely punctulate, sparsely pubescent. Prosternum not margined at tip, sparsely punctured in front, episterna coarsely and moderately densely punctured. Metasternal episterna long, obsoletely punctured and scarcely margined. Abdomen as in *cursor*, last segment margined with testaceous. Length .50—.64 inch; 12.5—16 mm.

Anterior femora of male simple.

The prosternal epipleuræ are narrow, but broader behind than in front, and vertical so that the sides of the thorax are obtusely margined. The affinities of this and the next species are too plain to be mistaken, and Chaudoir has done properly in placing them together.

Occurs in Georgia, Florida and Mexico. The specimens from the latter region are much larger.

42. **C. ruficauda,** Chaud.—Head bluish green, front at middle nearly smooth, at sides coarsely punctured, vertex and occiput coarsely punctured, a vague transverse impression behind the eyes, labrum truncate, antennæ rufous, third joint longer than the fourth. Thorax broader than long, sides strongly rounded and coarctate at base, hind angles rectangular slightly prominent, base truncate, disc convex (pulvinate), median line with vague impression, color dark blue, surface very coarsely and deeply punctured, the punctures denser at the base and sides. Elytra similar in form to *tricolor*, color black with slight tinge of blue, apical third orange red, surface sculptured as in *obsoletus;* epipleuræ, except at basal third, pale. Prosternum feebly or not margined at tip, in front with coarse punctures which become coarser and deeper as they approach the margin. Metasternal episterna moderately long, margined on the anterior end, coarsely punctured. Abdomen very sparsely punctate and pubescent. Legs pale. Length .44 inch; 11 mm.

The peculiarities of this species are so many as to render it distinct from every other in our fauna. The prothoracic epipleuræ here attain their minimum of development, being very narrow in their entire extent but narrower at base than apex. The basal impressions of thorax are totally obliterated, the base being squarely truncate.

In the males the anterior femora have a small spine near the basal third, while the ♀ femora are of normal form, and have no subangulation.

This species occurs in California, Fort Yuma, near the junction of the Gila and Colorado rivers, also in Mexico.

BRACHYLOBUS, Chaud.

This genus has been so well characterized by Chaudoir that I cannot do better than translate his words.

"The strange conformation of the mentum, altogether exceptional in this group, obliges me to separate this species from the rest of the *Chlaenius;* there are properly speaking no lobes; the mentum is transversely trapezoidal, much narrower anteriorly, scarcely at all emarginate in front, the sides very obliquely truncate, not at all arcuate and rather slightly sinuate; on each side of the middle is a deep round depression, the space between which is convex. Mentum tooth entirely absent.

This conformation of mentum is so peculiar that once seen it will be immediately recognized.

B. lithophilus, (Say).

This species is so well known as to need no special comment. It varies considerably in the form of the thorax as well as in color. The middle tibiæ of the male are as in *niger*, etc. Length .36—.38 inch; 9—9.5 mm.

Occurs from New York westward to Dakota and south to Texas.

ANOMOGLOSSUS, Chaud.

This genus differs from *Chlaenius* by the entire absence of any mentum tooth, the emargination being entirely filled with the basal membranous expansion of the ligula. The mandibles are also more elongate and less arcuate.

The males have the same pubescent space near the tip of the middle tibiæ which occurs in the more highly developed *Chlaenius*. The abdomen is punctured and pubescent over the entire surface, and the basal line of the elytra angulate at the humeri. The prosternum is margined at tip and coarsely punctured in all the species, and the metasternal episterna long.

The last joint of the maxillary palpi is glabrous in *emarginatus*, and slightly pubescent in the other two, the labrum deeply emarginate in *pusillus*, less in *emarginatus*, and very feebly in *amœnus*.

In color they all very nearly agree, head and thorax green, more or less bronzed, elytra bluish with brownish pubescence. Legs pale.

With these preliminary remarks, the following table will further assist in recognizing our species.

Thorax broader at base than apex, sides not at all sinuate posteriorly, hind angles obtuse, labrum moderately emarginate, last joint of maxillary palpi glabrous...**emarginatus.**

Thorax with base and apex equal, sides very feebly sinuate posteriorly, hind angles obtuse, labrum feebly emarginate, palpi slightly pubescent. **amœnus.**

Thorax narrower at base, sides very decidedly sinuate, hind angles acute, labrum deeply emarginate, palpi slightly pubescent..........**pusillus.**

A. emarginatus, Say.—Length .44—.52 inch; 11—13 mm.

Occurs from Canada to Kentucky.

A. amœnus, Dej.—Length .38 inch; 9.5 mm.

Appears to be rare in Georgia.

A. pusillus, Say.—Length .32—.34 inch; 8—8.5 mm.

From Massachusetts to Illinois.

BIBLIOGRAPHY AND SYNONYMY.

CHLAENIUS, Bon.

C. ruficauda, Chd., Bull. Mosc., 1856, II., p. 194; Monographie, Annali Mus. Civ. de Genova, VIII., 1876, p. 211.
  apicalis, || Lec., Ann. Lyc. V., p. 179.
  posticus, Lec., Journ. Acad. IV., 1858, pl. I, fig. 8.
  dimidiatus, Motsch., Etud. Ent., 1858, p. 157.
C. herbaceus, Chevr., Col. Mex. II., p. 188; Chaud. Monog., p. 212.
  patruelis, Lec., Ann. Lyc. IV., p. 135.
C. viridifrons, Esch., Zool. Atl. V., p. 27; Chaud. Monog., p. 224.

C. **erythropus**, Germ., Ins. Spec., Nov., p 11; Chaud. Monog., p. 217.
rufilabris, Dej., Spec. II., p. 329.
C. **fuscicornis**, Dej., Spec. V., p. 147; Chaud. Monog., p. 217.
C. **sericeus**, Forst., Nov., Spec. Ins. Cent. I., p. 58; Say, Trans. Am. Phil. Soc. II., p. 61; Dej., Spec. II., p. 347; Chaud. Monog., p. 217.
perviridis. Lec., Ann. Lyc. IV., p. 434.
var. *regularis*, Lec., Ann. Lyc. V., p. 179.
C. **Chaudoiri**, n. sp.
C. **cursor**, Chevr., Col. Mex. II., p. 168; Chaud. Monog., p. 212.
sparsus, Lec., New Species, 1868. p. 12.
C. **orbus**, Horn, Trans. Am. Ent. Soc., 1871, p. 326; Chaud. Monog. p. 216.
C. **laticollis**, Say, Trans. Am. Phil. Soc., n. s. II., p. 64; Chaud. Monog., p. 215.
rufipes, Dej., Spec. II., p. 331.
brevicollis, Lec., Ann. Lyc., 1856, II., p. 279.
brachyderus, Chaud., Bull. Mosc., 1856, III., p. 279.
C. **diffinis**, Chaud., Bull. Mosc., 1856, III., p. 279; Monog., p. 218.
laticollis, ‡ Lec., Proc. Acad., 1856, p. 25.
C. **platyderus**, Chaud., Bull. Mosc., 1856, III., p. 280.
C. **æstivus**, Say, Trans. Am. Phil. Soc., n. s. II., p. 62; Chaud. Monog., p. 219.
cobaltinus, Dej., Spec. II., p. 331.
var. *congener*, Lec., Proc. Acad., 1844, p. 51.
C. **viduus**, Horn, Trans. Am. Ent. Soc., 1871, p. 325; Chaud. Monog., p. 217.
C. **augustus**, Newm., Ent. Mag. V., p. 490; Lec., Ann. Lyc. IV., p. 433; Chaud. Monog., p. 219.
Lecontei, Hald., Proc. Acad. I., p. 304.
C. **cumatilis**, Lec., Ann. Lyc. V., p. 179; Journ. Acad. IV., pl. I, fig. 9; Chaud. Monog. p. 151.
C. **prasinus**, Dej., Spec. II., p. 345; Chaud. Monog., p. 191.
smaragdinus, Chaud., Bull. Mosc., 1843, p. 755.
C. **leucoscelis**, Chev., Col. Mex. I., 71; Chaud. Monog., p. 190.
monachus, Lec., Ann. Lyc. V., p. 180.
var. *cordicollis*, Kby., Fauna Am. Bor. IV., p. 22.
chlorophanus, ‡ Lec., Ann. Lyc. IV., p. 435.
C. **solitarius**, Say, Trans. Am. Phil. Soc. II., p. 65; Chaud. Monog., p. 191.
chlorophanus, Dej., Spec. V., p. 662; Chaud. Bull. Mosc., 1856, III., p. 247.
C. **obsoletus**, Lec., Ann. Lyc. V., p. 180; Chaud. Monog., p. 244.
? rogator, Motsch., Bull. Mosc., 1859, II., p. 157.
C. **flaccidus**, n. sp.
C. **vafer**, Lec., Proc. Acad., 1852, p. 66; Chaud. Monog., p. 240.
C. **variabilipes**, Esch., Zool. Atl. V., p. 27; Chaud. Monog., p. 243.
asperulus, Ménét., Bull. Acad., St. Petersb., 1844, II., p. 55.
obscurus, Lec., Ann. Lyc. V., p. 179.
C. **nebraskensis**, Lec., Proc. Acad., 1856, p. 28; Chaud. Monog., p 239.
C. **simillimus**, Chaud., Bull. Mosc., 1856, II., p. 283; Monog., p. 243.
vicinus, ‡ Mann., Bull. Mosc., 1843, p. 193.
C. **glaucus**, Lec., Proc. Acad., 1856, p. 28; Chaud. Monog., p. 239.
sericinitens, Chaud., Bull. Mosc., 1856, II., p. 284.
C. **nemoralis**, Say, Trans. Am. Phil. Soc. II., p. 65; Chaud. Monog., p. 241.
? fulgiceps, Newm., Ent. Mag. V., p. 490.
longicollis, Chaud., Bull. Mosc., 1843, p. 752.
var. *oxygonus*, Chaud., loc. cit., p. 753.

C. tricolor, Dej., Species II., p. 334; Chaud. Monog., p. 241.
vigilans, Say, Trans. Am. Phil. Soc., 1834, p. 419.
quadricollis, Kby., Fauna Bor. Amer. IV., p. 22; fide, Lec., Proc. Acad., 1873, p. 325.
chalybeipennis, Chevr., Col. Mex. I., p. 72.
atripennis, Lec., Ann. Lyc. IV., p. 336.
C. brevilabris, Lec., Ann. Lyc. IV., p. 337; Chaud. Monog., p. 241.
amœnus, Chaud., Bull. Mosc., 1856, II., p. 282.
consimilis, Lec., Ann. Lyc. IV., p. 337.
C. floridanus, n. sp.
C. pensylvanicus, Say, Trans. Am. Phil. Soc. II., p. 66; Chaud. Monog., p. 238.
vicinus, Dej , Spec. V., p. 659.
pubescens, Harris, N. Eng. Farmer, 1828.
impunctifrons, || Kby., Fauna Am. Bor. IV., p. 21.
C. texanus, n. sp.
C. circumcinctus, Say, Trans. Am. Phil. Soc. IV., p. 418.
perplexus, Dej., Spec. V., 655; Chaud. Monog., p. 237.
virens, Chaud., Bull. Mosc., 1843, p. 753.
Poeyi, Chevr., Annales Ent. Soc. Fr., 1863, p. 194.
C. impunctifrons, Say, Trans. Am. Phil. Soc. II., p. 64; Chaud. Monog., p. 250.
C. harpalinus, Esch., Zool. Atl. V., p. 27; Chaud. Monog., p. 251.
C. interruptus, n. sp.
C. niger, Randall, Bost. Journ. II., p. 34; Chaud. Monog. p. 258.
exaratus, La Ferté, Ann. Ent. Soc. Fr., 1851, p. 249.
C. alternatus, Horn, Trans. Am. Ent. Soc., 1871, p. 327; Chaud. Monog., p. 258.
C. purpuricollis, Randall, Bost. Journ. II., p. 35; Chaud. Monog., p. 213.
C. tomentosus, Say, (Epomis), Trans. Am. Phil. Soc. II., p. 60; Dej., Spec. II., p. 357; Chaud. Monog., p. 73.
luctuosa, Germ., (Amara), Ins. Spec., Nov., p. 10.
amplus, Lec., Proc. Acad., 1856, p. 29.
C. validus, Chevr., (Omaseus), Col. Mex. II., n. 174; Chaud. Monog., p. 75.

C. emarginatus, || Kby., Fauna Am. Bor. IV., p. 23.—This must be dropped. The name is preoccupied and the type is not in Brit. Mus.

BRACHYLOBUS, Chaud.

Monographie des Chléniens, p. 287.

B. lithophilus, Say, (Chlaenius), Trans. Am. Phil. Soc. II., p. 62; Chaud. loc. cit.
viridanus, Dej., Species V., p. 660.
smaragdiger, Motsch., Bull. Mosc., 1864, II., p. 338.

ANOMOGLOSSUS, Chaud.

A. emarginatus, Say, (*Chlaenius*), Trans. Am. Philos. Soc. II., p. 63; Dej., Species II., p. 366; Chaud. Bull. Mosc., 1857, III., p. 5.
A. amœnus, Dej., (*Chlaenius*), Species V., p. 648; Lec., New Species, 1863, p. 12.
A. pusillus, Say, (*Chlaenius*), loc. cit.
elegantulus, Dej., Species II., p. 367.
Feisthameli, Laferté, Ann. Ent. Soc. Fr., 1851, p. 248.

Notes on the architecture and habits of FORMICA PENNSYLVANICA, the Pennsylvania Carpenter Ant.

BY REV. HENRY C. MCCOOK.

In the summer of 1874, my attention was called to a colony of the Pennsylvania Carpenter Ant, *Formica Pennsylvanica*, De Geer, which had established a nest in a corner beam of Maryann Forge Mill, Blair Co., Pa. At a subsequent visit, August, 1876, I was enabled to obtain the section of the beam containing the formicary. The beam is of white pine, twelve by ten inches thick. This valuable privilege was due to the rare liberality of two of the heirs of the Bell estate, Mr. J. W. Riddle, the manager, and Mr. John Bell. Workmen were employed by these gentlemen to prop up the adjoining timbers, saw out the desired section, and substitute a block of equal proportions. Previous to this a vertical cutting had been chipped from the beam with the aid of augur and chisel, which exposed the interior of the nest quite fully. After the block had been thus removed, I had it sawed into smaller blocks in order to exhibit the entire internal structure of the formicary, of which it was thus possible to make a tolerably complete study. Indeed, the whole series of blocks forms as perfect an example of ant architecture as could well be obtained.

The first feature that attracts the eye in the vertical sections is this: on one side, and towards the centre the galleries are smaller and more thickly placed. It may be conjectured that here the original lodgment was made, and that the first galleries were carried upward and downward along this axis. As the necessities of the colony grew, and the supporting partitions and columns were reduced to the slightest dimensions commensurate with their purpose, the space required seems to have been procured by extending the boundaries on either side, until they reached within an inch of the surface.

Turning the attention to this labyrinth of cells with a view to its systematic structure, one observes the evident arrangement into stories and half stories, as represented at Fig. 1, Plate II. The surfaces of the floors are uneven, but may be traced for considerable distances upon the same general level. Some of these stories have been formed by driving tubular galleries, which were continually and gradually enlarged, and finally blended. The appearance of corridors or halls is quite manifest, running parallel in series of two, three, and more. (Pl. II, Fig. 1, a, a.) These are separated by columns and arches, or by partitions, which have been cut very thin, in many spots being just broken through. At one spot, Pl. II, Fig. 2, b, a section of one of these halls is entirely enclosed, forming a triangular chamber one and one-fourth inch in height, and one and one-half inch at the base It looks, in the specimen, somewhat like a bay window projecting over the walk. The roof of this chamber served as the floor of the room above, and its floor is evidently the ceiling of the large hall whose floor (Pl. II, Fig. 2, c,) appears below. The wall of this chamber was worn quite thin, making a small window like opening, (d,) through which by means of a probe it was readily ascertained that the room is hollow. The entrance is from the rear and side at e. The greatest amount of excavation is found in this block from which the drawings are made. It is twelve inches in height, and composes the lower part of the formicary.

The series of galleries thus described is terminated or surmounted by an irregular dome (Pl. II, Fig. 3,) which, with its pendant columns, presents a striking resemblance to the roof of a limestone cavern with its drooping stalactites. This is in fact the ceiling of the main formicary. It may be considered the first of a new series of works· whose outlines are represented at Pl. III, Figs. 2 and 3. The architecture of this second series whose characteristic is the dome or vault, is quite distinct from that of the first, the characteristic of which is the system of galleries and halls. The first series may be termed *Columnar*, the second *Cavernous*. The dome of Pl. II, Fig. 3, rises to the height of one and one-half inches. Above it, and communicating by at least two tubular "stairs" or ascents, is an irregular vault or series of vaults varying from three fourths of an inch to three inches in height, (Pl. III, Fig. 2.) The floors, walls and roofs of these cavities are tolerably smooth, and are blackish as though stained with formic acid. One of these vaults [a,] is somewhat separate from the central system, the connection being by a circuitous gallery [b,] five inches long. The floor of this vault (Pl. III, Fig. 3,) is of irregular form; the surface is uneven, as is common with the floor of the galleries and halls, but is cut and gouged in several spots as though with a knife. It is free from the stains which mark the rest of the series. The roof (Fig. 2, a,) is diamond-shaped, and at two angles (x and y,) has communication upward and laterally for several inches, as determined by probing, with galleries and wide halls. Vaults similar to those described above are excavated in the main formicary, forming the lower part thereof, only reduced in size. The outlines of these vaults are represented in the figure.

It would be interesting to determine accurately the economy of these various cavities, but for obvious reasons we must be limited to a general knowledge of their uses. The younger Huber tried to accustom Fuliginous Ants, a species of the Carpenter Ants of Europe, (*Formica fuliginosa*, Latr.), to live and work under his inspection. But the instinct of the creature for seclusion was too persistent to be overcome even by the ingenuity of that eminent naturalist. Had I been as well acquainted with the facts above detailed before dividing the block as after, I might at least have observed more carefully the distribution and the larvæ and pupæ, which were found within the cavities in great numbers. I can only say that as the block was sawn in pieces these objects were discovered in all parts of the formicary. They were certainly stowed upon the floors of the galleries; and, I believe, were massed within the vaults. As to the use of the close chamber, (Pl. II, fig. 2,) and the secluded vault, (Pl. III, figs. 2 a, 3 a.) it would be presumptuous to venture a conjecture; but one may at least raise the query: may they not have been royal chambers, the apartments of the queen-ant, or the nursery for rearing the future or the contingent sovereigns of the colony? Or, (which is perhaps a more fruitful query): are these the rooms in which the workers deposited the eggs as they dropped from the body of the fertile queen?

The entire cubical contents of beam occupied by the formicary is two feet in length, by about seven inches in width and depth. The height of the formicary above the ground was about twenty-four feet; the lowest cells were nearly four feet above the floor of the second story of the flour-mill, in which it was situated. The ants were thus removed from those exigencies of moisture and temperature with which their congeners in the field have to contend, and it is difficult to conceive how the varying altitude of the halls and vaults could have served in the regulation of the temperature needful to the health of the larvæ and pupæ, as for example in the hills of *Formica rufa*. The position of the formicary in the beam is noted at Pl. III, fig. 1, a.

The external entrances to the formicary are circular and oblong doors pierced at irregular intervals, in all sides of the beam. They open for the most part into tubular, circuitous galleries communicating with the interior. Some of them, however, enter immediately upon spacious vestibules, which may have been used when occasion required that the larvæ and pupæ should be brought nearer to the air. The location of these doors, in connection with the general arrangement of the galleries, appear to give ample facility for ventilation. A vertical fissure in the beam, which extended for some distance along it, was, under my observation the main avenue of communication with the interior. The worker-ants were continually coming out of this crack bearing in their mandibles a fibre of wood. This was dropped upon a cross beam eighteen inches below, upon which a small heap of the chips might commonly be seen. [See Pl. III, fig. 1. b.] At this heap was a squad of workers busily carrying the chips to the edge of the log and dropping them upon the stair which was just beneath. The miller informed me that at first the ants wrought upon this last heap of cuttings also, but finding that he cleared off the litter each day with his broom, finally abandoned this department of their engineering, as quite super-erogatory, and confined their enterprise to the crack and the cross-beam. They thus displayed the very human characteristic of avoiding all needless work.

This habit of clearing away their cuttings is a settled instinct of these creatures. They have been seen to exhibit it in Fairmount Park, diligently removing the chips from the foot of a cedar tree in which they dwell. I have often observed the same habit in certain colonies which inhabit the trees in the neighborhood of the Academy of Natural Sciences on Logan Square, Philadelphia. A small maple tree, eight inches in diameter, on Race street near Eighteenth, was the special object of attention. One squad wrought on the north side, in a cavity eight or nine inches long by three or four wide, a little over one foot above the sidewalk. Within the cavity quantities of chips were accumulated. At this point also workers were continually arriving bearing food, such as small worms, and brownish, grain-like objects which I took to be coccidæ, although I cannot speak with certainty. I traced one of these workers from the cavity some distance away to the next tree up which it ascended until lost to sight. It was perhaps on a foraging expedition among the upper branches. In order to determine if the wood-workers would care for the food also, I took a cocceus from a carrier and laid it in the cavity. One of the cutters having dropped her bit of wood, seized this and carried it within. There is probably no permanent division of labor, but all the workers either carve at the galleries or forage for supplies as occasion or inclination may suggest.

On the west side of the tree, a few inches from the roots, there was a small tubular opening, which was hidden behind a bulging scale of bark. Out of this the ants were dropping cuttings which had accumulated in a goodly heap at the base of the trunk. Two workers were engaged upon this heap carrying the litter to the curbstone and casting it into the gutter. It was interesting and indeed amusing to observe the behavior of the little creature in this act. Having reached the edge of the curbstone, she would rear upon her hind legs, poise herself a moment thus, and bending forward, release or cast the chip from her jaws. Sometimes a rapid motion of the fore legs against the face followed, as though to clear the mandibles of any remaining particles of sawdust. A gentle breeze that was blowing lifted up the ejected cutting and carried it a greater or less distance down the gutter which for several feet was strewn with the chippings. Under numerous observations, the worker almost invariably assumed the ramparat posture when "dumping" her load of lumber. The economy of this instinct of carriage is probably something more than a mere habit of cleanliness. It may have regard primarily to the safety of the insect, in removing from the vicinity of its dwelling such conspicuous signs of its presence. The amount of wood excavated during a day is, relatively considered, enormous. The instruments by which this work is done are the mandibles, [Pl. IV, fig. 6, g,] stout, subtriangular organs, set in the extremity of the face. They are black, serrate, convex externally, concave within like the palm of the human hand. There are five strong teeth, the outer one being the longest and sharpest, and having an inclination from the face, the inner one rather blunt, with inclination toward the face. The muscles by which these organs are moved must be very powerful to admit of such results. I had conjectured that they may allow a vertical as well as lateral motion, so that the mandibles act as *saws* as well as *scrapers*. It is probable, however, that for the most part the wood is scraped off. The general appearance of the architecture, the organism of the jaws, and observations upon insects enclosed in boxes, point to this conclusion. The external figure of this mandible raises something more than a suggestion of the hand or claw of vertebrate animals. A thorough anatomical analysis of it under the microscope, if undertaken by some competent person, might show striking analogies in structure. Only the female and the worker (which is indeed an undeveloped female), have this toothed formation of the mandible; that of the male [Pl. IV, fig. 6, h,] is club-shaped and smooth, evidently disqualifying him for labor or defense. It is a remarkable fact that what may be called by analogy, "the moral qualities" of insects are possessed well nigh exclusively by the female. The period of activity, or perhaps of greatest activity, in this work of excavation is from the middle of June to the middle of July. My own observations at least would lead to this inference. This period, therefore, probably marks the time when the necessities of the nursling ants, or the prospective increase in the family, or both, require enlargement of the household space.

The ability of these ants to inflict loss upon man was a subject of investigation. I have not confined myself to my own observations and inferences, but have inquired largely of lumbermen and mechanics, and gentlemen of practical knowledge. Much information was received from the miller and carpenter upon the Bell estate.* The carpenter did not regard the damage done by the ants as serious, being confined to the occasional spoiling of a saw-log. He had observed them, for the most part, in white pine, and thought that they usually made entrance at a knot-hole, "sawyer" hole, or some bruised or shattered point. He had found the nests at all heights, but thought that when the ants build high up, the trees are usually sound. He remembered one white pine tree the top of which had been cut well nigh off by ants at the height of seventy-five feet from the ground, and had been blown down from the weakening. The nest in the mill-beam was about as large a one as he had seen.

The miller had often seen the ants working in maple, and red oak, but most frequently in pine. He had found the nests elevated twenty, thirty feet, and higher; generally they were "pretty well up, ten, twelve, fifteen feet." He had many times come upon the nests in logs when sawing in the mill. He had worked for some time upon the mountains at making staves for "shook," and had seen very frequently the loss of the blocks by the operations of the ants. He had found in logs formicaries as long as six feet. The ants usually take hold of some decayed part of the tree, but he had often found them in wood perfectly sound. This is about the tenor of the testimony which I gathered from various quarters. One statement may be added, which I had no opportunity to verify, but was given me in apparent sincerity. A young farmer upon the western slope of Brush Mountain, said that a tract of oak timber eight or ten acres in extent, belonging to his father, had been almost totally ruined by these insects.

Injuries of the kind and extent above reported certainly do not entail serious loss, however inconvenient at times. But the thought has arisen, might not such excavations as represented in this specimen from the mill-beam become very serious at times, as for example, in the case of railroad bridges? We have only to suppose a colony of the Pennsylvania Carpenter ants to be lodged and at work within a bridge-beam of the size of this specimen, in order to suggest an element of considerable peril. There is no supposition more likely than this; at least there is not the slightest improbability in such. A glance at this thoroughly honey-combed block shows at once, without any special knowledge of the resisting force of woods, that the strength of the beam twelve by ten inches, from which it was cut, must have been greatly weakened by the excavation. It is possible that the depredations of insects, as the carpenter ants and white ants, upon the wood-work of bridges and other public works, may not have received due attention from our public carriers.

---

* Messrs. Heltzel and Gesey. These men are fair representatives of our most intelligent artisans, and showed the greatest interest in all my researches.

However, that no exaggerated conclusion or needless alarm may arise from this statement, I am able to modify it somewhat by giving approximately the period of time consumed in bringing this formicary to its present condition. The miller had observed the colony at work upon the beam for more than five years. By inquiry of one of the proprietors, the existence of the colony was traced back certainly three, probably five years beyond that date. Thus eight or ten years have been spent in scraping out this labyrinth of galleries and vaults. No doubt other colonies under more favorable conditions may work more rapidly. Nevertheless, the fact of such moderate progress, greatly modifies the conditions of danger. However, even the slightest sign of threatened peril in such a case is worthy of the profoundest caution and consideration. The trees within which by observation or credible report this species of ant has been found working, are maple, cedar, red oak, black oak, hickory, and pine.

It is not, perhaps, a matter of great economical importance to determine the agents which, as natural enemies, counter-work to prevent the destructive increase of the Pennsylvania ants. It is, however, an important item in the natural history of the creature. I am not able to contribute much to this point of inquiry from observation. I have learned from a farmer on Brush Mountain, that the crows feed upon them freely. Doubtless many other species of birds find them a tempting and delicate morsel. The hunters in the mountains declare that the bears eat these ants, tearing old logs in pieces in order to break up the formicaries and reach their inhabitants.* I have further learned from a young man who had often watched the conflicts, that the Fallow ants (*F. rufa*), are inveterate foes of the Pennsylvania ants. I have myself observed the energy with which the former resent the approach of the latter to their hills. While encamped upon Brush Mountain last summer studying the habits of the Fallow ants, I witnessed a stubborn conflict between a number of these insects and a large winged queen of *F. Pennsylvanica*. During a temporary absence a party of laborers visited camp, and intruding within the tent, upset an artificial formicary which I had established in a glass jar and set under the canvas for safety. The men were driven off, but as the nest on which the ants were working appeared to be demolished, our man John, a shrewd German, concluded to try an experiment of his own. He had caught the infection of investigation! Seizing a large queen of Pennsylvanica he dropped it amongst the rufas and awaited results. When I returned he announced the disaster and his experiment in the same breath, and eagerly summoned me to witness the fray. Ten dead rufas lay upon the earth within the jar. The black queen was in the very act of crushing one of her plucky assailants between her formidable jaws. Two "squeezes" of the powerful implements and the red foe was cast out disabled. Another immediately sprang upon the queen's face, was seized by the thorax, crushed and cast aside as her comrade had been. In the meantime two ants held the queen back by one of the antennæ. They evidently knew how sensitive these organs are, and as plainly understood the importance of keeping rid of the ponderous mandibles. For, each held the antenna by the extreme joint, and had withdrawn as far from the face as possible, holding the queen, so to speak, "at arms length." One of them had backed up a tiny twig which projected through the soil, and ascended or descended, according to the queen's movements, keeping the antenna all the while taut. Other ants had seized upon other parts of the body. While I looked the queen was, or appeared to be dragged out of sight into a cell or gallery, which remained unbroken or had been restored after the overturning of the jar. I now supposed that the combat was

---

* This fondness of the bear for ants has the authority of very ancient tradition. Thus (says Cowan), the "Treasurie of Avncient and Moderne Times," printed A. D., 1613, avers that "the Bear, being poysoned by the Hearbe named *Mandragoras* or *Mandrake*, doth purge his bodie by the eating of Ants or Pismires." Long before this Plutarch wrote (the quotation is from Holland's translation), that "the bear finding herself, upon fullness, given to loth and distaste for food, she goes to find out Ants' nests, where she sits her down, lolling out her tongue, which is glib and soft with a kind of sweet and slimy humour, until it be full of ants and their egges; then draweth it she in again,

---

swalloweth them down, and thereby cureth her lothing stomack." Whether the truth abide with the Allegheny hunter who attributes the inroad of Bruin upon the formicidæ to simple hunger, or with the ancient chronicler who ascribes it to some natural capability for the healing art, who shall decide? Certainly, on the one hand, the abdomens of the ants filled with honeydew, would be quite agreeable to the notorious "sweet tooth" of the bear. On the other, there is the formic acid which the ant yields, that *may* be a sovereign remedy for the ailments of poor Bruin. In this view of the case we might perhaps be able to account for the fact that the "Medicine man" of our aboriginal tribes, so commonly affects the hide of a bear for his Esculapian rites.

ended, and that the vanquished and captive queen was about to be sacrificed to the ferocity of her "red" and mercurial adversaries. I laid the jar aside, made note of the affair, and thought no more of it until the next day, when, chancing to pick up the jar, I found the queen in the very position in which she had first been observed. The same ants, or two others just like them, were hanging to the outstretched antennæ, thus holding their huge royal enemy in complete durance. More than twenty-four hours had elapsed since the former observation, during which time the combatants had doubtless remained *in statu quo.* I released and turned loose the unhappy carpenter queen, and repeopled my disturbed colony of Fallow ants.

The most destructive enemy of these, as of other ants, is probably our severe winter. Numbers die under the exposure; but a remnant become torpid and survive the cold season. I have found little clusters of these very early in the calendar spring, in knot-holes and decayed portions of trees, in a semi-torpid condition. A curious instance of their power to endure the opposite extreme of heat, fell under my notice during the summer encampment above referred to. Our servant had built a rude wall around two sides of the camp-fire, upon the corner of which he had placed a large flat stone. One day he had occasion to remove this stone and found the under side covered with black ants. He called me to the spot, and I observed large numbers of workers and queens, who had evidently taken refuge upon the under part of the slab, from their formicary in a bit of a stump that had been thrown upon the fire. A portion of the stump which touched the top of the wall, had been the means of communication. I found a few ants still on this portion and rescued them. There was quite a large fire in the hearth, and the decayed log in which the ants were housed had been burning for some time. How long the ants had been upon the flat stone I cannot say, neither can I give the exact temperature of the slab. It may well be conjectured, however, that it was quite hot. The ants seemed to be entirely uninjured by the baking, and scampered off into the grass as lively as possible. What most puzzled me was the fact that they remained huddled together upon the under side of the stone, and had not rather sought the upper side which was surely less exposed to the heat. It was perhaps impossible for them to have escaped by running down the wall, on account of the outbreaking flames and the greater heat of the stones beneath. But it was also a matter of some surprise that the insects had not dropped off the stone and thus escaped. The instinct of association seemed to hold them together in the exigency; and the instinct of self-preservation through their habitual secrecy, had perhaps kept them blindly to the point more exposed to the fire. The fact is a curious and interesting one, but I have not felt at liberty to experiment upon the question which it raises, viz.: the power of this ant to endure extreme heat.

Worms, insects, and refuse matter of various kinds furnish the Pennsylvania ants with food. They also feed largely upon the honey-dew of the aphides. In the formicary in the mill there was no trace of anything that could have served for food. The miller had frequently seen the ants carrying flies but never grain. I fancied that there might be some communication through the beam with the mill-race in order to tap a water supply. But after considerable examination along the foundation timbers, tracing the beam to the water, and searching diligently everywhere for signs of openings or chippings, I discovered nothing.

Within the formicary, as it has been described above, were found winged and unwinged insects, grubs or larvæ, and cocoons or pupæ. The winged insects were the unfertile females and males, and were in considerable and about equal numbers. The females were three-fourths of an inch in length, and one-eighth of an inch across the thorax. The males were seven-sixteenths of an inch long, and one-sixteenth of an inch across the thorax. The unwinged insects were of three distinct forms, the worker major or soldier, one-half of an inch long, the worker minor-large, seven-sixteenths of an inch, and the worker minor-small, one-fourth of an inch in length. The last form, for convenience, I have called the "dwarf." We note the most apparent distinctions between these five forms. The unfertile female may at once be distinguished by its size and wings. The queen or fertile female was not found, but is doubtless (as is common with the genus), unwinged. There are five abdominal rings, while in the male there are six. There is also a marked difference in the shape of the abdomen which in the female is sub-cylindrical, and in the male sub-conical, the segments tapering toward the apex, at which appear the (four) thread-like organs distinctive of the sex. There is also a marked difference in the antennæ, which in the female have twelve joints, (1 + 11), and in the male thirteen, (1 + 12); the female antennæ are moreover much stouter than the male. The legs of the female are much stouter, and in proportion, shorter than those of the male. There is a very great difference in the size of the head in the two sexes, that of the female being far the greater. The most interesting difference, perhaps, is in the structure of the mandible, as already referred to. [See Plate IV, with explanation, for these various forms.]

The workers or neuters may be regarded as undeveloped females, and accordingly we find them assimilated to the female in the structure of the mandibles, the number of abdominal rings and the number of joints upon the antennæ. The major also resembles the queen in the size of the head. The legs of all the workers, at least in length, more nearly approach the male. The common differences between the workers and the two sexes are very marked: first, the absence of wings; second, the shape of the thorax, which in the female and male is roundish and wide, and in all the workers is narrower at the prothorax, compressed and wedge-shaped below. (See Pl. IV, figs. 1—5.) Third, the absence of the three oscelli upon the base of the caput, a difference which is very curious. I conjecture that it has some relation to the fact that the females and males alone are designed to traverse the air, as in the "marriage flight," and that the oscelli are servicible to direct their course at that time. On this theory one can understand why the workers are simply supplied with the characteristic compound eye. However, if as Huber supposes, the worker ant can be developed at will (as with bees), into a fertile queen from the grub, by special feeding and care, it is difficult to see how the oscelli are also developed. I could trace no "germ" of them by ordinary working glass. The females were very numerous, and it would be difficult to conceive the lack of a queen in a colony so well supplied as this one.

The three forms of workers have very apparent differences among themselves. The major although about the same length as the minor, is stouter, and especially is distinguished by superior size of the head. In this respect and in general form the major closely resembles the female, while the minor and the dwarf more nearly approach the male. The small minor or dwarf has the small head and is but half the size of the minor-large, of which it is simply a reduced form. The shape of the scale throughout all the worker and female forms is the same. In the male it is shorter, more notched at the tip, thicker at the base and stands more erect upon the pedicle. [Pl. IV, fig. 7.]

These differences in structure among the working members of the formicary start inquiries as to the functions and offices of each. Have all the same duties? If so, why such marked difference? If the variation in structure does indicate a variety of office, what are the several duties of the worker classes? It may contribute something to the solution to say that, at the original opening of the beam, the worker major was the only form that seemed disposed to attack me. On offering my finger to one of these it was immediately seized, and pinched again and again with much rigor. It seemed thus to be the veritable soldier of the republic. The queens and males made no effort to save the cocoons; the workers, without distinction, engaged in this duty. I am not now able to say whether the ants observed carrying the cutting of trees upon which they were working, were of all ranks, but have the impression that they were.*

Within the formicary were stored many cocoons and a few larvæ. The cocoons are of a dark straw color, except a very few which are white. I opened a number, and found several to contain males, but most of them workers. The dwarfs were the most numerous rank, being, in one box examined, as thirty to fifty. In size the cocoons correspond to the imago of corresponding rank and sex, the dwarf cocoons averaging about one-fourth of an inch, the others about three-eighths of an inch. The worker majors next to the dwarfs were most numerous. No females were found within cocoons. The position of the pupa within the envelope is about as follows—The head is bent forward and downward upon the sternum, the legs drawn up, the femur of the first leg along the side of the head, and the other legs drawn up nearly parallel thereto. The remaining joints are stretched along and beneath the abdomen, the last leg reaching down to the apex. The antennæ extend over the legs downward. In the males the wings appear in a thick fold apparently enclosed within a gauze-like sack, pressed against the thorax between the tibias of the second and third pair of legs. The head and forepart of the body when the pupæ were first taken (August 22d), were whitish, the abdomen tinged with brown. The color deepened day by day, and at the end of a month became a deep brown and black. This change occurred in a young worker just delivered from the shell in one week, the ant turning from pale to normal black. The eye appears black and prominent upon the white face of the young pupa.

Of a number of cocoons kept for observation, some remained alive until September 24th, a period of thirty-four days. No observation was made between the above date and October 4th, at which time all were dead. The vitality of the pupa could always be noted by touching the cocoon, whereupon a vigorous motion ensued. This motion would often begin as soon as the box was opened, but almost invariably when the cocoon was stroked gently. It is doubtless this motion which notifies the nurses of the proper time for opening the shell. A cocoon of *F. Pennsylvanica* was placed in a jar with a worker of *F. rufa*. The latter was immediately attracted by the agitation within the silken shell, stroked the cocoon with her antennæ, seized it with her jaws as if to tear it, but abandoned the task. Did she find the covering too tough, or perceive the difference of species? It seems to me that the various speculations as to the manner in which the nurses know when to deliver the pupæ, may reasonably be set aside and the above conclusion accepted. Certainly, the kicking of the imprisoned antling is apparent enough to attract even the most stupid nurse, and the vigor of the motions, perhaps even the beginning of them, might easily give warning of the proper time for cutting the envelop. I am inclined to think, from some observations made, that the head of the pupa is released first; if so, the position of the legs would enable the antling, by pushing and stretching, to aid largely in its own release.

---

* This fact I hope to determine next summer; also whether the dwarf is capable of cutting. Its mandibles are similar in structure to the larger ranks, but of course smaller.

A worker of *F. Pennsylvanica* was placed within a paper box with a cocoon which she had seized. At the end of a week she had delivered her nursling, which, however, was dead when observed, although the worker was alive. This cocoon was opened at the head. None of the cocoons, kept separate from ants, were open. It is clear that the pupæ cannot release themselves without the aid of the worker. Some of the antlings above referred to, when released by me, were quite developed, of normal size and color, and walked off with much vigor. Yet in the course of a month or more they were not able to secure liberty by their unaided effort. There is no appearance of swathing that could probably prevent free action of the limbs; the only thing resembling this being a light filament which unites the thorax and the abdomen, passing over and around the scale.

Of the larvæ three sizes were found. The most numerous were evidently those of the dwarfs, soft, small white grubs. The others were nearly of the same length, and differed mainly in size, one form having more plumpness than the other. These grubs (Pl. IV, fig. 11,) were of faint straw color, or livid.

New Species of DIURNAL LEPIDOPTERA.

BY W. H. EDWARDS.

Argynnis Alcestis.

Primaries much produced, strongly arched, the hind margin slightly concave.

Male.—Expands 2.7 inch. Upper side uniform bright red-fulvous, scarcely obscured by brown at base; hind margins bordered by two parallel lines, on the inner side of which, on primaries, are spots, lunate next apex, elsewhere serrate, and lunate on secondaries; other markings as in *Aphrodite*, the discal band of secondaries not being confluent, but composed of widely separated lunate spots; fringes of primaries alternately fuscous and yellowish, in equal parts, of secondaries yellowish, with fuscous only at the end of the nervules.

Under side of primaries fiery red, except next apex, where the whole area is chocolate-brown; the hind margin broadly bordered with nearly same shade of brown; the spots resting on this are serrate or lanceolate, those on the apical half of the wing inclosing well silvered spaces, the others brown; there are also three sub-apical silver spots, as in most of the allied species, and in addition, the rounded black spots on the lower discoidal and two median interspaces often have their outer edges silvered; other examples differ in that the color of the ground is cinnamon-red, and the area between cell and median nervule to apex, buff, the nervules well covered with red, and sometimes the whole buff space is washed with faint red; there is then also a large brown sub-apical patch.

Secondaries of one uniform color from base to margin, either dark chocolate-brown, or deep ferruginous-brown, with no mottling of other colors on the disc; occasionally, in the middle of the space between the two outer rows of spots, there is a narrow strip which shows a buff sub-color, washed by the prevailing shade of the wing; and sometimes this buff is distinct; the spots conspicuous for size, and well silvered; those of the outer row sub-triangular, edged above with a broad border of the ground color; the second row, consisting of eight spots, has the first three, and the fifth and sixth, nearly equal, obovate; the fourth small, triangular; the seventh sub-lunate; the eighth on inner margin, sometimes wanting, but when present, of same size and shape as the seventh; in the third row are five spots; these, as well as the spots of second row heavily edged with black on basal side; in the cell either one or two round spots, and below cell an oval, all ringed with black; there are also three spots in the interspaces next base; shoulder and inner margin well silvered.

Body above red-fulvous; below, the thorax buff, with fulvous hairs; the abdomen reddish-buff; legs reddish-buff; palpi buff, fulvous in front and at tip; antennæ black, fulvous on under side; club black, tipped with fulvous.

Female.—Expands 3.5 to 4 inches. Upper side darker than the male, less bright, more obscured by brown at base; the marginal lines heavy, and more or less confluent on primaries; the sub-marginal spots also unite with the band, and are enlarged, and the fulvous spaces inclosed are not paler than the ground color elsewhere; all the marks and inscriptions heavier than in the male; on secondaries the discal band is either of separated lunules, but larger and nearer together than in the male, or the posterior half of the band is confluent, while the outer remains separated.

Under side of primaries deep red, passing into dark brown near the apex; the silver spots as in the male; secondaries wholly dark-ferruginous, or often olive black, as in *Idalia*, with no pale band between the outer rows of spots; the spots large and well silvered.

Egg.—Of same general pattern as the eggs of *Cybele*, *Aphrodite*, and other of our large species of Argynnis, but longer in proportion to the breadth than in any of them so far known, the sides straighter also and less rounded. Laid upon violet. The larva emerges in about twenty-four days, and hybernates in its first stage. It cannot be distinguished at this stage from the larva of either of the species named.

This species is found in Northern Illinois, Iowa and Colorado, and has been regarded as a variety of *Aphrodite*. I have examined large numbers of examples the past season, and am satisfied of its distinctness. The coloration of the under side of secondaries is remarkable, many of the females resembling *Idalia* in this respect, while other females and the males are covered with one uniform shade of bright or dark-ferruginous brown, free from all mottling like that seen in *Aphrodite*.

Chrysophanus Nais.

Male.—Expands 1.4 inch. Upper side yellow-fulvous, spotted and shaded with black; hind margins edged by a black line, and a paler narrow border, followed by a common fulvous belt, on the posterior edge of which is a series of rounded black spots, of equal size, and completely crossing each wing; next preceding is a common, narrow black band, wavy on the inner half of primaries, and all of secondaries; from this to base primaries have the ground fulvous, but blackened on both margins; secondaries have the corresponding area fuscous, except the cell, and a narrow extra-discal belt, which are fulvous; both wings crossed by a discal row of rounded spots; at the extremity of each cell a black transverse bar, and three others within, near the middle, and in a group; also below each cell are three similar bars; fringes black and white in irregular areas.

Under side of primaries orange, except a little spot of buff, quite at the margin in each interspace, and a sub-apical stripe of same color reaching nearly to end of cell; the hind margin edged by a heavy black line; the sub-marginal spots of upper side repeated, somewhat reduced; the black band represented by a line of sub-quadrate spots; the discal row also repeated, the lower three or four spots being elongated and set obliquely; the spots in and below cell also repeated, reduced. Secondaries yellowish, or sordid white; the margin and the next two rows of spots as in primaries, the space between these rows being orange, forming a conspicuous belt, fading into the ground as it approaches the outer angle; an irregular row of small spots crosses the disc, and on the inner side of this, against the cell, and also in submedian interspace is an orange discoloration; the spots in and below the cell repeated, reduced.

Body above fuscous, below yellowish, both thorax and abdomen; legs buff; palpi whitish; antennæ annulated black and white; club black, reddish at tip.

Female.—Expands 1.5 inch. Marked as in the male, but the color brighter; the fulvous space next preceding the fuscous band is partly replaced by white, especially next the costa and the inner margin; on the under side the orange is brighter; the sides of the abdomen fulvous.

From one ♂ taken several years ago in Southern California, by Dr. Smart, and a ♀ recently received from Prescott, Arizona.

This species is very distinct in its markings above from any of our species, but below resembles somewhat *Thoe.* It is similar in shape and size to that species.

Hesperia Deva.

Female.—Expands 2 inches. Upper side uniform glossy brown, rather light in tint; primaries have three translucent spots, sub-apical, small, round, equal, in a straight line depending from costa; a fourth slightly larger than these near the top of the upper median interspace, and a fifth an elongated narrow bar, in the next below, a little nearer base than the fourth; both these completely cross the interspaces; secondaries immaculate, fringes concolored.

Under side slightly paler in tint, darker on the disc of primaries and up to base, lighter next inner angle; the spots repeated; secondaries immaculate. Body above dark-brown, below, the thorax gray buff, the abdomen brown; palpi white; antennæ annulated, brown and dull white; club black, reddish at tip.

From a single example received from Prescott. The species is allied to *Accius.*

INDEX.

The names of new genera and of new species are followed by the name of the Author.

PAGE.
Agama albipes, *Cress.* 99
Agapostemon melliventris, *Cress.* 101
Agrotis (list of species) 90
    excellens, *Grote* 115
    Normanianus, *Grote* 89
    triangulum 89
Amara (table of species) 127, 128
    basillaris 127
    brunnipes 127
    conflata 127
    confusa 127
    crassispina 127
    cupreolata 127
    exarata 128
    fallax 127
    impuncticollis 127
    insignis 127
    insularis, *Horn* 128
    latior 128
    littoralis 127
    polita 127
    protensa 127
    Putzeysii, *Horn* 129
    septentrionalis 129
    subpunctata 127
Amblychila 233
Amphionycha 150
Ancylochira connexa, *Horn* 148
Anisodactylus (table of species) 129
    californicus 130
    consobrinus 130
    semipunctatus 130
Anisotoma paludicola, *Crotch* 74
Anodochilus exiguus 250
Anomoglossus (table of species) 274
    (list of species) 276
    amœnus 274
    emarginatus 274
    pusillus 274
Apatura Leilia, *Edw.* 103
Aphodius precursor, *Horn* 245

PAGE.
Aplastus (table of species) 24
    angusticollis, *Horn* 25
    corymbitoides, *Horn* 25
    molestus, *Horn* 27
    optatus 26
    speratus 26
    tenuiformis, *Horn* 25
Araeopus, *Lec* 56
    monachus, *Lec* 57
Argynnis Alcestis, *Edw* 289
    Carpenterii, *Edw* 204
    Clio, *Edw* 106
    Nausicaa, *Edw* 104
    Nitocris, *Edw* 15
    Opis, *Edw* 105
    Rhodope, *Edw* 13
Asclera discolor, *Lec* 70
Blakea, *Grote* 118
    Gundlachianus 118
Blapstinus latifrons, *Lec* 70
Blethisa (table of species) 247
    Julii 247
    multipunctatus 247
    oregonensis 247
    quadricollis 247
Bolina 116
    ochreifascia 117
Bombus nevadensis, *Cress* 102
Brachylobus 273
    lithophilus 273, 276
Brachypsectra, *Lec* 55
    fulva, *Lec* 56
Bradytus (table of species) 128
    exarata 128
    latior 128
    Putzeysii, *Horn* 128, 129
    septentrionalis 128
Bruchidæ 151
Buprestidæ 147
Buprestis connexa, *Horn* 148
Calosoma Palmeri, *Horn* 199

PAGE.

- Cantharis Crotchii, *Horn*.......... 38
  - insperatus, *Horn*.......... 39
  - mutilata, *Horn*.......... 155
  - tenebrosa.......... 38
- Carabidæ.......... 126
- Carabus (table of species).......... 247
  - Chamissonis.......... 247
  - finitimus.......... 247, 248
  - fulgidus.......... 126
  - hortensis.......... 126
  - limbatus.......... 248
  - palustris.......... 247
  - serratus.......... 247
  - sylvosus.......... 247, 248
  - tædatus.......... 247
  - truncaticollis.......... 247
  - Vietinghovii.......... 247
  - vinctus.......... 248
- Catocala.......... 93
  - (list of species).......... 97
  - adoptiva, *Grote*.......... 96
  - anna, *Grote*.......... 96
  - coelebs, *Grote*.......... 96
  - Editha, *Edw.*.......... 112
  - flavidalis.......... 95
  - innubens.......... 95
  - Levettei, *Grote*.......... 95
  - simulatilis, *Grote*.......... 94
- Chalcophora Fulleri, *Horn*.......... 147
- Chauliognathus (table of species).. 78
  - basalis.......... 78
  - discus.......... 78
  - Lewisii, *Crotch*.......... 78
  - limbicollis.......... 78
  - marginata.......... 78
  - opacus.......... 78
  - pennsylvanicus... 78
  - profundus.......... 78
  - scutellaris.......... 78
- Chilometopon, *Horn*.......... 31
  - abnorme.......... 31
  - helopioides, *Horn*... 31
- Chlaenius (Revision of).......... 253
  - (table of species).......... 255
  - (list of species).......... 274
  - æstivus.......... 268
  - alternatus.......... 258
  - augustus.......... 268

PAGE.

- Chlaenius brevilabris.......... 263
  - Chaudoiri, *Horn*.......... 270
  - circumcinctus.......... 261
  - cumatilis.......... 267
  - cursor.......... 270
  - diffinis.......... 269
  - erythropus.......... 272
  - flaccidus, *Horn*.......... 265
  - floridanus, *Horn*.......... 263
  - fuscicornis.......... 271
  - glaucus.......... 264
  - harpalinus.......... 260
  - herbaceus.......... 272
  - impunctifrons.......... 260
  - interruptus, *Horn*.......... 259
  - laticollis.......... 270
  - leucoscelis.......... 266
  - maxillosus, *Horn*.......... 260
  - nebraskensis.......... 264
  - nemoralis.......... 263
  - niger.......... 259
  - obsoletus.......... 266
  - orbus.......... 270
  - pennsylvanicus.......... 262
  - platyderus.......... 269
  - prasinus.......... 267
  - punctulatus, *Horn*.......... 244
  - purpuricollis.......... 258
  - ruficauda.......... 273
  - sericeus.......... 271
  - simillimus.......... 264
  - solitarius.......... 266
  - texanus, *Horn*.......... 261
  - tomentosus.......... 258
  - tricolor.......... 263
  - vafer.......... 265
  - validus.......... 257
  - variabilipes.......... 265
  - viduus.......... 268
  - viridifrons.......... 272
- Chœridium? ebeninum, *Horn*.......... 244
- Chrysomelidæ.......... 151
- Chrysophanus Nais, *Edw*.......... 291
- Cicindelidæ.......... 126, 233
- Cicindela.......... 234
  - abdominalis.......... 160
  - cuprascens.......... 237, 238
  - 10-notata.......... 158

PAGE.

- Cicindela dorsalis 236
  - gratiosa 240
  - hamata 237
  - hirtilabris, *Lec.* 161, 239
  - hyperborea 158
  - longilabris 157
  - macra 238
  - maga, *Lec.* 161
  - Magdalenæ, *Lec.* 159, 238, 239
  - marginata 237
  - marginipennis 160
  - montana 157
  - nevadica, *Lec.* 159, 239
  - politula, *Lec.* 159
  - puritana 238
  - Schauppii, *Horn* 240
  - scutellaris 157
  - sperata 239
  - striga, *Lec.* 160
  - Wapleri, *Lec.* 158, 238
- Cirrhobolina, *Grote* 117
  - deducta 117
  - incandescens, *Grote* 117
- Cistelidæ 156
- Cistela Thevenetii, *Horn* 156
  - variabilis, *Horn* 156
- Cleophana occata, *Grote* 114
- Cleridæ 149
- Clinidium calcaratum, *Lec* 164
  - sculptile 164
- Clivina elongata 248
- Cœlambus masculinus, *Crotch* 74
  - unguicularis, *Crotch* 73
- Cœlotaxis, *Horn* 200
  - muricata, *Horn* 201
  - punctulata, *Horn* 201
- Cœlus 201
- Cœnonycha, *Horn* 129
  - ovipennis, *Horn* 193, 194
  - rotundata 192, 193
  - socialis, *Horn* 192, 193
- Colastus agavensis, *Crotch* 76, 170
  - yuccæ, *Crotch* 75, 170
- Coleoptera of Guadalupe Island 198
- Colias Eriphyle, *Edw* 202
- Coniontis 200
- Coprophilus striatulus 170

PAGE.

- Cordylospasta, *Horn* 152
  - Fulleri, *Horn* 152
- Corphyra (table of species) 40
  - abnormis, *Horn* 40
  - Bardii, *Horn* 42
  - Crotchii, *Horn* 41
  - distinguenda, *Horn* 42
  - funebris 41
  - inconspicua, *Horn* 42
  - monticola, *Horn* 41
  - punctulata 41
  - vittata 41
- Cremastochilus crinitus, *Lec* 55
  - retractus, *Lec.* 54
- Crepidodera basalis, *Crotch* 80
- Cryphalus carinulatus, *Lec* 70
  - digestus, *Lec* 71
  - puncticollis, *Lec.* 71
- Cryptadius 32
  - inflatus 32
- Cryptocephalus nigerrimus, *Crotch.* 78
- Cupesidæ 87
- Cupes 165
  - capitata 88
  - concolor 88
  - lobiceps, *Lec* 88
- Cychrus mimus, *Horn* 20
  - minor, *Horn* 243
  - Wheatleyi, *Horn* 242
- Cyclocephala *elegans* 143
- Cymatodera (table of species) 221
  - (list of species) 230
  - angustata 229
  - Belfragei, *Horn* 226
  - bicolor 224
  - brunnea 223
  - californica 225
  - fascifera 225
  - fuscula 227, 228
  - inornata 224
  - longicornis 221
  - morosa 226
  - oblita 227
  - ovipennis 229
  - punctata 227
  - puncticollis 222
  - tenera 230

PAGE.
Cymatodera undulata.......... 228
  usta.......... 223
  Xanti, *Horn*.......... 222
Cymindis aurora, *Horn*.......... 243
Cyphon robustus, *Lec*.......... 171
Dacne picea.......... 170
Dacoderus dominicensis, *Horn*.......... 219
  striaticeps.......... 219
Dadopera texana, *Crotch*.......... 76
Dermestidæ.......... 135
Dermestes signatus, *Lec*.......... 50
Dialytes Ulkei, *Horn*.......... 141
Dicælus alutaceus, *Horn*.......... 244
Dichelonycha.......... 185
  (table of species).......... 186
  albicollis.......... 190
  Bachii.......... 189
  canadensis, *Horn*.......... 188
  clypeata, *Horn*.......... 190
  Crotchii, *Horn*.......... 189
  elongata.......... 187
  fulgida.......... 190
  fuscula.......... 189
  pallens.......... 188
  pusilla.......... 191
  subvittata.......... 187
  sulcata.......... 191
  testacea.......... 188
  truncata.......... 190
  valida.......... 191
Dicranopselaphus Edwardsii, *Lec*.. 57
Dictyoptera dimidiata, *Lec*.......... 172
  rubripennis, *Lec*.......... 172
  ruficollis, *Lec*.......... 172
Diplochætus.......... 249, 250
Ditemnus obtusus, *Lec*.......... 62
Dyschirius salivagans, *Lec*.......... 169
Dytiscidæ.......... 250
Elaphidion alienum, *Lec*.......... 173
Elaphrus (table of species).......... 246
  cicatricosus.......... 246
  Clairvillei.......... 246
  fuliginosus.......... 246
  lævigatus.......... 246
  Lecontei.......... 246
  obliteratus.......... 246
  olivaceus.......... 246, 247

PAGE.
Elaphrus riparius.......... 246
  ruscarius.......... 246
Elateridæ.......... 148
Elater Phelpsii, *Horn*.......... 22
Eleodes texana.......... 34
  vetorator, *Horn*.......... 33
Elmis cæsus, *Lec*.......... 53
  corpulentus, *Lec*.......... 52
  divergens, *Lec*.......... 52
  foveatus, *Lec*.......... 53
  seriatus, *Lec*.......... 52
  vulneratus, *Lec*.......... 53
Endomychidæ.......... 132
Epicauta Alphonsii, *Horn*...... 38, 154
  Batesii, *Horn*.......... 153
  Oregona, *Horn*.......... 153
  Rileyi, *Horn*.......... 37
  sanguinicollis.......... 37
Epimetopus costalis.......... 251
Epuræa Hornii, *Crotch*.......... 76
  ? monogama, *Crotch*.......... 76
  texana, *Crotch*.......... 76
Erebia Haydenii.......... 19
Esthesopus bicolor, *Horn*.......... 22
Euceratocerus, *Lec*.......... 65
  Hornii, *Lec*.......... 65
Eucinetus punctulatus, *Lec*.......... 172
  strigosus, *Lec*.......... 171
Eucnemidæ.......... 149
Euptychia Henshawii, *Edw*.......... 205
Eurois pressus, *Grote*.......... 90
Eurygenus campanulatus, *Lec*.......... 69
Eusattus.......... 201
Eustrophus impressicollis, *Lec*.......... 69
Formica pennsylvanica.......... 277
Geirocheilus Tritonia, *Edw*.......... 18
Georyssus californicum, *Lec*.......... 51
Glischrochilus.......... 133
Glyphonyx mimeticus, *Horn*.......... 23
Glyptoscelis varicolor, *Crotch*.......... 79
Gnathospasta, *Horn*.......... 154
  mimetica, *Horn*.......... 154
Gnorimus maculosus.......... 197
Grapta Oreas.......... 169
  Rusticus, *Edw*.......... 167
  Silvius, *Edw*.......... 168
Grynocharis pilosula, *Crotch*.......... 77

PAGE.

Gyascutus californicus, *Horn* 147
Hadena delicata, *Grote* 92
    flava, *Grote* 91
    mactata 91
Halictus trizonatus, *Cress* 101
Hedobia granosa, *Lec* 63
Heliophila ligata, *Grote* 115
Heliothis cupes, *Grote* 113
Helops arizonensis, *Horn* 36
    Bachei 201
Hesperia Comus, *Edw* 206
    Deva, *Edw* 292
    Nereus, *Edw* 207
    Zampa, *Edw* 207
Hetærius tristriatus, *Horn* 21
Holciophorus serripes, *Lec* 169
Homohadena 92
    angulata, *Grote* 93
    Kappa, *Grote* 92
Hybodera debilis, *Lec* 66
Hydnobius Matthewsii, *Crotch* 74
Hydrocharis (table of species) 251
    castus 251
    glaucus 251
    obtusatus 251
Hydroporus masculinus, *Crotch* 74
    unguicularis, *Crotch* 73
Hydroscapia, *Lec* 45
    natans, *Lec* 46
Hypocephalidæ 209
Hypocephalus 209
    armatus 217
Hypodacne, *Lec* 170
    punctata, *Lec* 171
Iphthimus serratus 35
    zopheroides, *Horn* 34
Ips (table of species) 133
    confluentus 134
    cylindricus 134, 135
    fasciatus 134
    obtusus 133
    sanguinolentus 134
    vittatus 134
Kalissus, *Lec* 50
    nitidus, *Lec* 51
Lasconotus? linearis, *Crotch* 75
Lebasiella maculicollis, *Lec* 63

PAGE.

Leistus piceus 169
Leptura rhodopus, *Lec* 68
Ligyrus (table of species) 143
    gibbosus 143
    relictus 143
    rugiceps 143
    ruginosus 143
Lucanidæ 137
Luperus graptoderoides, *Crotch* 89
Lymexylidæ 149
Lytta mutilata, *Horn* 155
Macrodactylus 183
    (table of species) 184
    angustatus 185
    subspinosus 184
    uniformis, *Horn* 185
Malachius (table of species) 28
    macer, *Horn* 27
    mirandus 28
    mixtus 28
    spinipennis, *Horn* 27
    Thevenetii, *Horn* 28
    Ulkei 28
Mamestra lubens, *Grote* 113
Mastinocerus texanus, *Lec* 59
Matheteus, *Lec* 58
    Theveneti, *Lec* 59
Mecynotarsus candidus, *Lec* 175
    elegans, *Lec* 175
Melanomma, *Grote* 117
    auricinctaria, *Grote* 117
Melissodes nevadensis, *Cress* 102
Melitæa Acastus, *Edw* 16
Meloidæ 152
Microphotus angustus, *Lec* 58
Monommidæ 151
Mutilla Arota, *Cress* 120
    Edwardsii, *Cress* 119
    erudita, *Cress* 120
    pacifica, *Cress* 120
    peculiaris, *Cress* 119
    tecta, *Cress* 119
    Ursula, *Cress* 120
Mycterus quadricollis, *Horn* 42
Nitidulidæ 133
Nomia nevadensis, *Cress* 101
Nosodendron californicum, *Horn* 22

PAGE.

- Notiophilus (table of species)........ 247
  - æneus........................ 247
  - Hardyi........................ 247
  - nitens........................ 247
  - semiopacus.................... 247
  - semistriatus.................. 247
  - sibiricus..................... 247
  - sylvaticus.................... 247
- Nyctobates subnitens, *Horn*......... 35
- Oberea quadricallosa, *Lec*............ 68
- Ochodæus.................................. 177
  - (table of species)........... 180
  - biarmatus..................... 182
  - duplex........................ 183
  - frontalis..................... 183
  - musculus...................... 182
  - pectoralis.................... 181
  - simplex....................... 182
  - sparsus....................... 183
  - striatus...................... 183
  - Ulkei, *Horn*.................. 182
- Odontata Hardyi, *Crotch*............. 80
- Oestodes puncticollis, *Horn*.......... 24
- Omus..................................... 234
  - Edwardsii, *Crotch*.............. 73
  - Hornii, *Lec*.................... 157
  - sequoiarum, *Crotch*............. 73
- Onthophagus.......................... 137
  - (table of species). 138, 140
  - Hecate........................ 138
  - Janus......................... 139
  - Orpheus....................... 139
  - pensylvanicus................. 141
  - striatulus.................... 139
  - subæneus...................... 139
  - tuberculifrons................ 140
  - velutinus, *Horn*.............. 140
- Orchestris ramosa, *Crotch*............ 80
- Orthosia disticha, *Grote*............... 114
- Othniidæ................................. 151
- Oxylæmus californicus, *Crotch*...... 75
- Pachybrachys Donneri, *Crotch*...... 78
  - circumcinctus, *Crotch*. 79
- Pachyplectrus, *Lec*..................... 53
  - lævis, *Lec*............. 54
- Papilio Gundlachianus................. 118
  - Hippocrates..................... 208

PAGE.

- Paromalus difficilis, *Horn*............ 21
- Patrobus................................ 248
  - (table of species)............ 130
  - aterrimus..................... 131
  - californicus.................. 130
  - longicornis................... 130
  - rugicollis.................... 130
  - septentrionis................. 130
- Pelidnota lugubris, *Lec*............... 54
- Perimegatoma, *Horn*.................. 135
  - (table of species)... 135
  - Belfragei............. 137
  - cylindricum........... 136
  - falsum, *Horn*......... 136
  - variegatum, *Horn*. 136
- Phanæus antiquus, *Horn*.............. 245
- Phengodes integripennis, *Lec*........ 59
- Phthora americana, *Horn*............. 35
- Phymatodes nitidus, *Lec*.............. 66
- Phytalis................................... 142
- Pityophagus............................ 133
  - cephalotes................ 135
  - rufipennis................ 135
- Pleocoma................................ 81
  - (table of species)............ 82
  - (larva of)..................... 84
  - Behrensii, *Lec*............... 83
  - Edwardsii, *Lec*............... 83
  - fimbriata...................... 82
  - hirticollis.................... 83
- Pleotomus............................... 173
- Pogonistes........................ 249, 250
- Pogonus................................. 249
  - depressus, *Lec*.............. 44
  - Lecontei....................... 250
  - parallelus, *Lec*............. 44
  - planatus...................... 250
  - texanus................. 45, 250
- Polycaon obliquus, *Lec*............... 66
  - plicatus, *Lec*.............. 65
- Priacma, *Lec*..................... 87, 165
  - serrata......................... 87
- Prostomus americanus, *Crotch*...... 74
- Prothymia orgiæ, *Grote*.............. 116
- Pterostichus............................ 243
- Ptomaphagus leptinoides, *Crotch*... 77
- Purpuricenus magnificus, *Lec*...... 173

PAGE.
Rhina frontalis, *Lec*.... 70
Rhipiphorus (table of species).... 121
bifoveatus, *Horn*.... 123
cruentus.... 124
dimidiatus.... 122
flavipennis.... 122
limbatus.... 125
linearis.... 125
octomaculatus.... 123
pectinatus.... 124
puncticeps.... 123
rufus.... 125
Sayi.... 123
Rhizophagus cylindricus.... 135
Rhyssodes.... 165
exaratus.... 162
hamatus, *Lec*.... 163
Satyrus Phocus, *Edw*.... 14
Scaphidema pictum, *Horn*.... 36
Scaphididæ.... 132
Scaphidium (table of species).... 132
quadriguttatum.... 132
Scaptolenus estriatus, *Lec*.... 55
Scarabæidæ.... 137
Scelolyperus, *Crotch*.... 79
tejonicus, *Crotch*.... 79
Schizillus, *Horn*.... 33
laticeps, *Horn*.... 33
Scotobænus.... 151
parallelus.... 35
Scotobates, *Horn*.... 151
Scymnus coniferarum, *Crotch*.... 77
pacificus, *Crotch*.... 77
Phelpsii, *Crotch*.... 77
Sepidulum, *Lec*.... 47
costatum, *Lec*.... 47, 251
Silis (table of species).... 60
cava, *Lec*.... 61
difficilis.... 60
filigua, *Lec*.... 62
flavida, *Lec*.... 61
lutea.... 62
pallida.... 60
percomis.... 61
spinigera, *Lec*.... 61
vulnerata, *Lec*.... 61
Spalacopsis stolata.... 174

PAGE.
Stereopalpus pruinosus, *Lec*.... 69
Stibia.... 30
(table of species).... 29
hispidula, *Horn*.... 29
ovipennis, *Horn*.... 28
puncticollis.... 29
Stizus nevadensis, *Cress*.... 99
Strangalia delicata, *Lec*.... 68
Strategus (table of species).... 143
Antæus.... 144
cessus.... 146
Julianus.... 144
Mormon.... 146
splendens.... 145
Synchloe Crocale, *Edw*.... 17
Tanarthrus salicola, *Lec*.... 174
Tanyrhinus singularis.... 132
Tenebrionidæ.... 151
Tetracha.... 234
Tetragonoderus latipennis, *Lec*.... 44
Thanaos Alpheus, *Edw*.... 206
Thanasimus melanocephalus.... 149
Thecla Siva, *Edw*.... 110
Thricolema, *Crotch*.... 79
anomala, *Crotch*.... 80
Throscinus, *Lec*.... 51
Crotchii, *Lec*.... 52
Tomicus latidens, *Lec*.... 72
Toxotus virgatus, *Lec*.... 67
Trechicus (synonymy).... 126, 248
Trechus chalybæus.... 131
ovipennis.... 131
rubens.... 131
Trichius.... 194, 197
(table of species).... 194
affinis.... 195
bibens.... 195
delta.... 196
piger.... 194
texanus, *Horn*.... 195
viridulus.... 196
Trichodes (table of species).... 231
apivorus.... 231
bibalteatus.... 231
bimaculatus, *Lec*.... 63
bisignatus.... 231
illustris, *Horn*.... 231

PAGE.

- Trichodes Nuttallii 231
  - ornatus 231
- Trichonyx striatus, *Lec* 49
- Trictenotoma 167
- Trigonopleurus rugulosus 149
- Trigonurus cælatus, *Lec* 48
  - Crotchii, *Lec* 48
- Trimytis 30
- Triorophus 30
- Triphalus 30
- Triphyllus elongatus, *Lec* 171
- Trogoderma Belfragei, *Lec* 50
- Trogosita yuccæ, *Crotch* 75
- Tropisternus (table of species) 251
  - californicus 252
  - ellipticus 252
  - glaber 252
  - lateralis 251, 252
  - limbalis 251
  - mixtus 252
  - striolatus 251, 252
  - sublævis 252
- Trox (table of species) 1, 6
  - æqualis 10
  - asper 4
  - atrox 11
  - capillaris 9
  - erinaceus 8
  - fascifer 11
  - foveicollis 10
  - gemmulatus, *Horn* 8
  - integer 5
  - laticollis 12
  - monachus 3
  - morsus 5
  - punctatus 5
  - scaber 11
  - scabrosus 3
  - scutellaris 2
  - Sonoræ 8

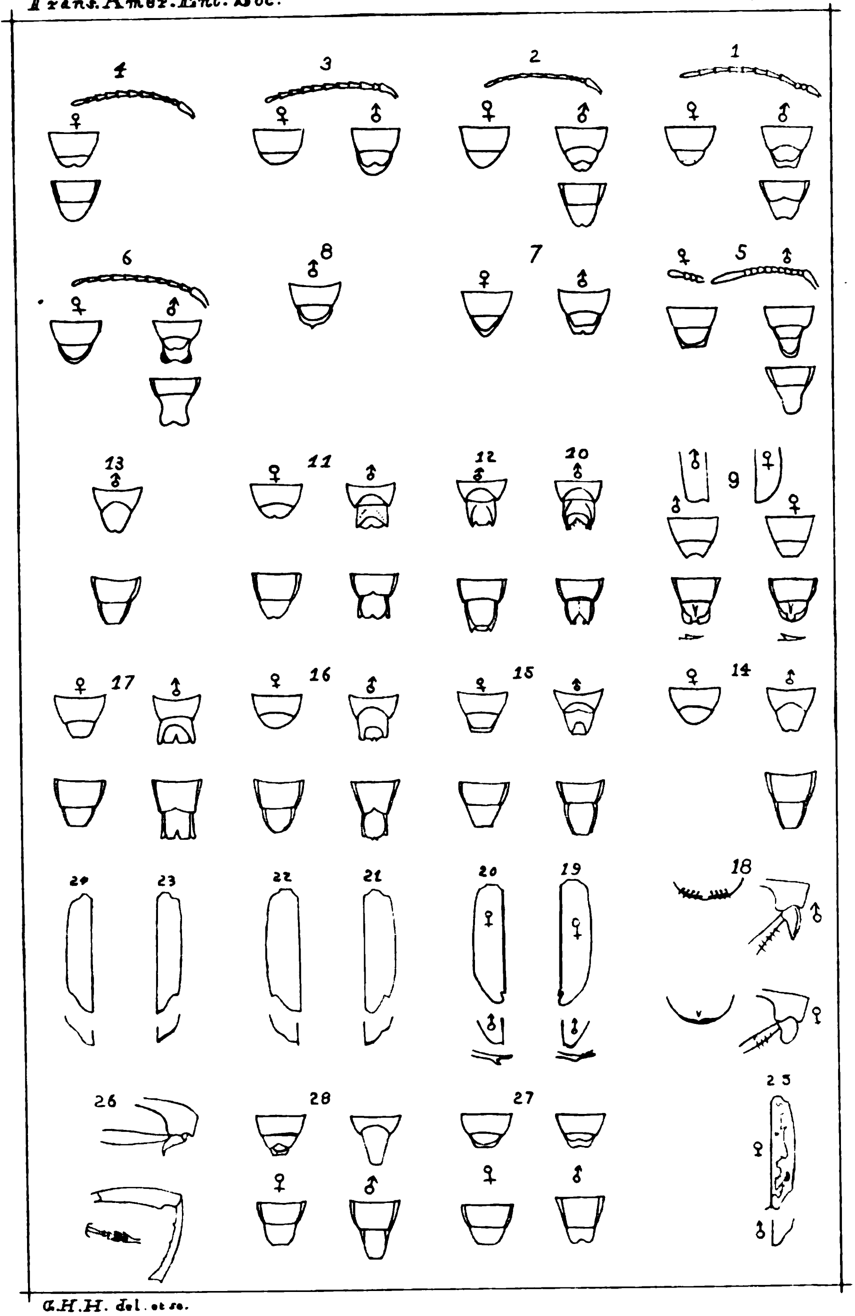
PAGE.

- Trox sordidus 9
  - striatus 12
  - suberosus 5
  - suturalis 2
  - terrestris 10
  - tesselatus 5
  - texanus 2
  - tuberculatus 7
  - umbonatus 2
  - unistriatus 9
- Tychus cognatus, *Lec* 50
- Vespa occidentalis, *Cress* 100
- Vrilletta, *Lec* 64
  - convexa, *Lec* 65
  - expansa, *Lec* 64
  - Murrayi, *Lec* 64
- Xanthochroa californica, *Horn* 39
- Xestobium affine, *Lec* 63
  - squalidum, *Lec* 64
- Xyleborus hamatus, *Lec* 72
  - vicinus, *Lec* 72
- Xylophilus ater, *Lec* 175
  - brunnipennis, *Lec* 176
  - impressus, *Lec* 175
  - nebulosus, *Lec* 175
  - subfasciatus, *Lec* 176
  - ventricosus, *Lec* 176
- Xylotrechus nitidus 150
  - planifrons, *Lec* 67
- Zalobius, *Lec* 49
  - serricollis, *Lec* 170
  - spinicollis, *Lec* 49
- Zengophora californica, *Crotch* 78
- Zonitis (table of species) 155
  - atripennis 155
  - bilineata 155
  - flavida 155
  - longicornis 155
  - rufa 155
  - vittipennis, *Horn* 155

EXPLANATION OF PLATE I.

Fig. 1.—*Cymatodera longicornis*, Lec. Antenna. Male fifth and sixth abdominal segments, dorsal and ventral view; female ventral view.
Fig. 2.—*C. puncticollis*, Bland. Same as above.
Fig. 3.—*C. Xanti*, Horn. Antenna. Male and female fifth and sixth ventral.
Fig. 4.—*C. usta*, Lec. Antenna. Female fifth and sixth ventral and dorsal.
Fig. 5.—*C. brunnea*, Mels. Same as 1.
Fig. 6.—*C. bicolor*, Say. Same as 1.
Fig. 7.—*C. inornata*, Say. Male and female fifth and sixth ventral.
Fig. 8.—*C. fascifera*, Lec. Male fifth and sixth ventral, with last dorsal prolonged.
Fig. 9.—*C. californica*, Horn. Elytra ♂ and ♀. Dorsal and ventral aspect of last two segments, also the carina ♂ and ♀.
Fig. 10.—*C. morosa*, Lec. Fifth and sixth segments ♂ dorsal and ventral aspect.
Fig. 11.—*C. Belfragei*, Horn. Dorsal and ventral views of fifth and sixth segments of each sex.
Fig. 12.—*C. oblita*, Horn. Dorsal and ventral views of ♂ fifth and sixth segments.
Fig. 13.—*C. punctata*, Lec. Same as above.
Fig. 14.—*C. fuscula*, Lec. Same as 1.
Fig. 15.—*C. undulata*, Say. Dorsal and ventral views of segments five and six, male and female.
Fig. 16.—*C. angustata*, Spin. Same as 15.
Fig. 17.—*C. ovipennis*, Lec. Same as 15.
Fig. 27.—*Elasmocerus terminatus*, Say. Same as 15.
Fig. 28.—*Trichodes biballeatus*, Lec. Same as 15.
Fig. 18.—Hind trochanter and last ventral ♂ and ♀ of *Amblychila*.
Fig. 19.—Tips of elytra ♂ and ♀ and right mandible ♂ of *Cic. lacerata*.
Fig. 20.—Ditto of *C. marginata*.
Fig. 21.—Tips of elytra ♂ and ♀ of *Cic. cuprascens*.
Fig. 22.—Ditto of *Cic. puritana*.
Fig. 23.—Ditto of *Cic. macra*.
Fig. 24.—Ditto of *Cic. blanda*.
Fig. 25.—Ditto of *Cic. hirtilabris*.
Fig. 26.—Hind trochanter, middle tibia and anterior tarsus of *Calosoma Sayi* ♂.

Remarks.—The accompanying plate has been prepared and engraved by myself, and it may seem hardly necessary to state is not up to the standard of high *artistic* merit. It is to be hoped that the sketches will assist the student in forming a better idea of the curious sexual differences, so difficult to express in words, than could be obtained by description only.



G.H.H. del. et sc.

EXPLANATION OF PLATE II.

Fig. 1.—View of the galleries, drawn from nature, showing the Columnar architecture. A side view into four galleries is given, (*a*, *a*) and the formation of stories and half stories shown. The smooth surface with window-like openings, at the side of the figure, is the plane cut by the saw in dividing the block. See page 277. This view represents the galleries in their natural position as found in the beam, the top of the figure being above, the bottom below.

Fig. 2.—The triangular chamber described on page 278. *b*, the chamber; *c*, the floor of hall beneath; *d*, window; *e*, side entrances.

Fig. 3.—A view of a section of the roof of the main formicary, showing the termination above of the galleries. It also indicates the internal character of the Cavernous architecture outlined in Plate III figures 2 and 3. See page 278.

Fig. 1

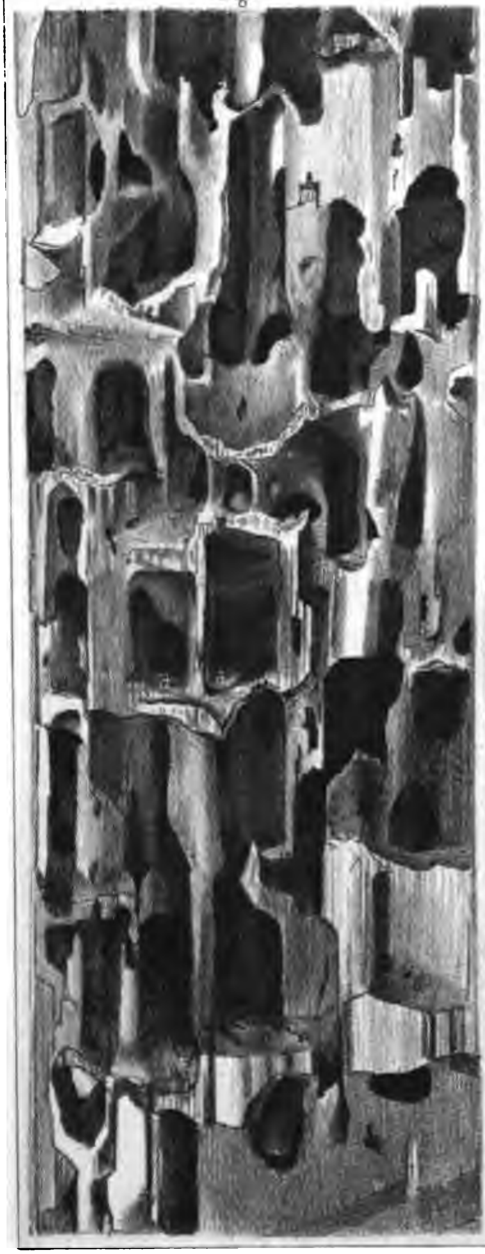


Fig. 2

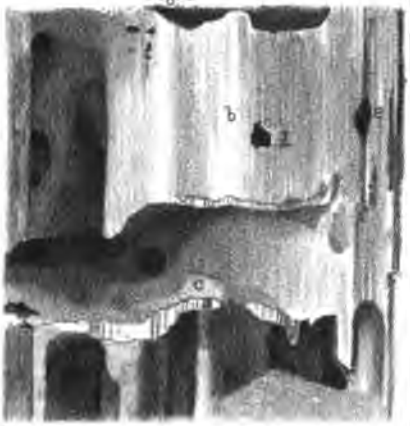
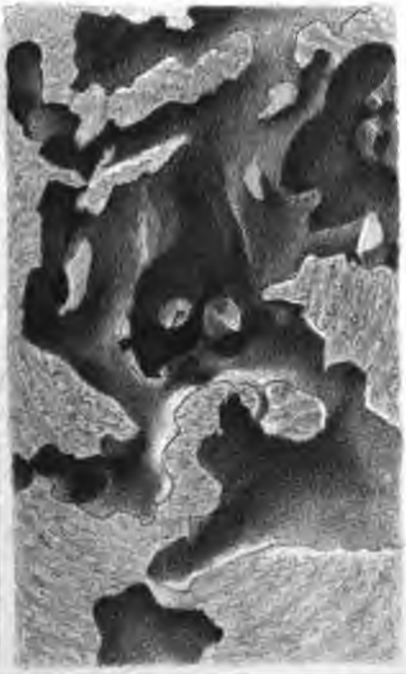


Fig. 3

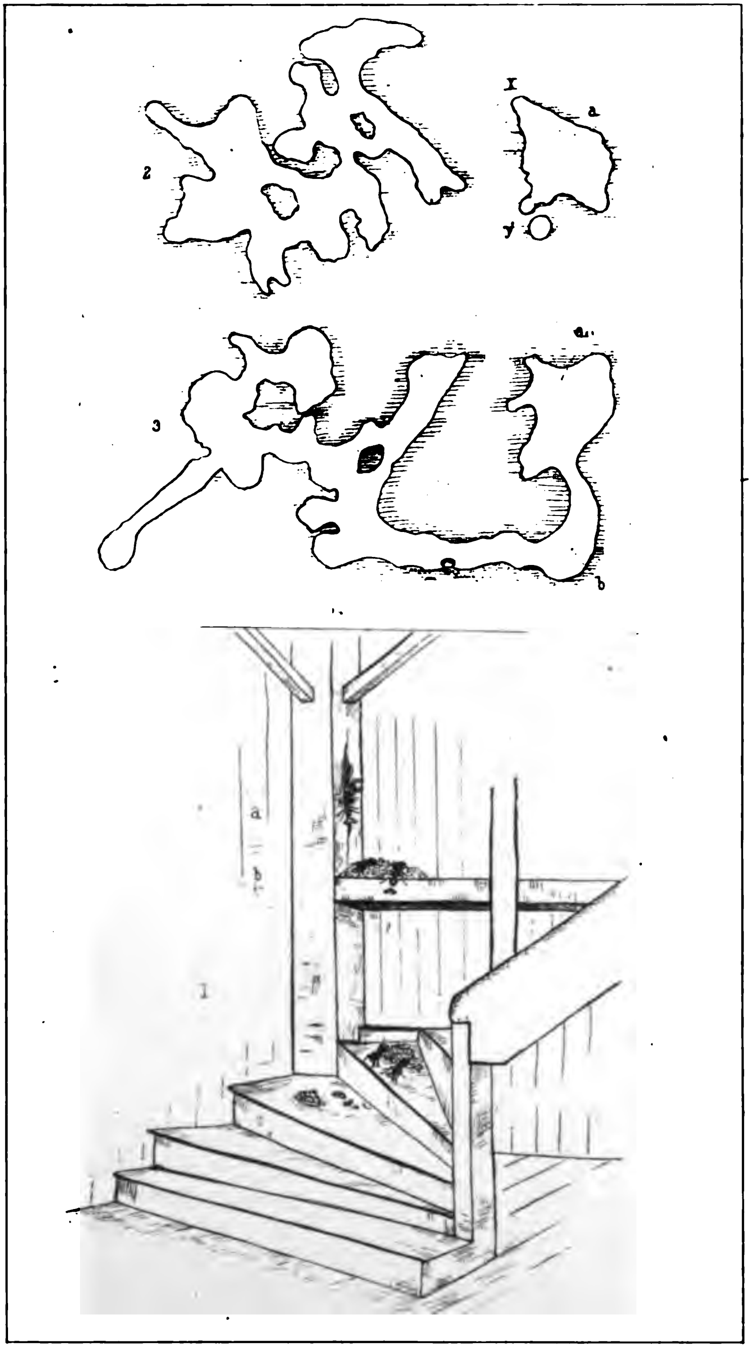


Architecture F. Pennsylvanica-natural size.

EXPLANATION OF PLATE III.

Fig. 1.—Location of the beam in the mill, showing at *a* the portion of the formicary; at *b* the cross-beam upon which the cuttings were dropped. See pages 279 and 280.

Figs. 2 and 3.—Impression outlines of the Cavernous structures described on page 278, reduced in size. Fig. 3, the floor; *b*, the gallery communicating with the vault *a*. Fig. 2, outline of the roof; *a* the roof of vault corresponding with 3, *a*; entrances at *x* and *y*. See pages 278 and 279.



F. Pennsylvanica, Architecture.

EXPLANATION OF PLATE IV.

Fig. 1.—Outline form of female.

Fig. 2.—Male.

Fig. 3.—Worker major or soldier.

Fig. 4.—Worker minor.

Fig. 5.—Dwarf.

Fig. 6.—Enlarged view of the head of the worker and queen. *a*, section of the terminal part of the antenna of a nymph, enlarged; *b*, *c*, antenna of female and worker; *d*, antenna of male; *e*, palpi; *f*, tongue; *g*, mandible of the female and worker; *k*, mandible of the male; *h*, the eye; *l*, ocelli.

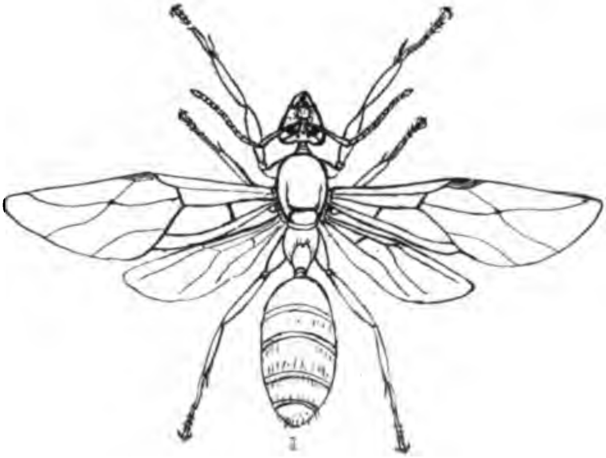
Fig. 7.—Scale: *a*, of female; *b*, of male.

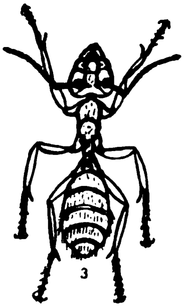
Fig. 8.—Fore leg: *a*, of female and worker; *b*, of male. The tibial spur is bent upon the fore leg, straight upon the other legs.

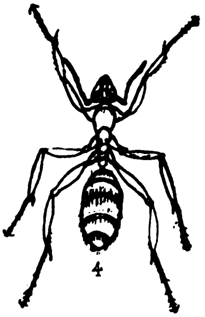
Fig. 9.—Foot, or termination of the tarsal joint: *a*, of female and worker; *b*, of male.

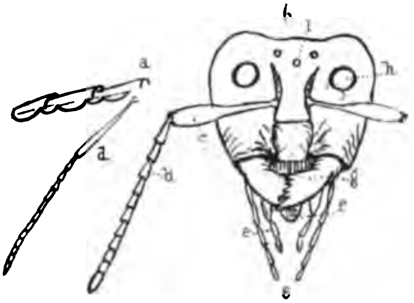
Fig. 10.—Abdominal plates.

Fig. 11.—Larva of large form, probably of queen or worker major.

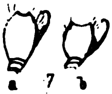

1


3


4

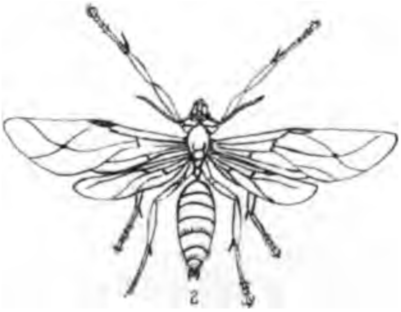


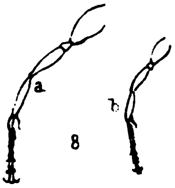
6



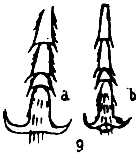
7

5


2

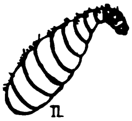


8



9

10


11

F. Pennsylvanica, 1-5 twice natural size; bodies black, bristles golden.